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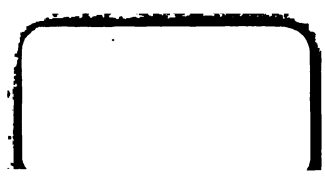

REPORTS

OF THE

INSPECTORS OF MINES

OF THE

ANTHRACITE COAL REGIONS

OF

PENNSYLVANIA,

FOR THE

YEAR 1872.

HARRISBURG:
BENJAMIN SINGERLY, STATE PRINTER,
1873.

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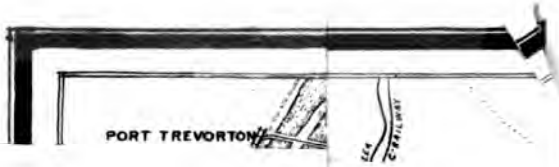
PORT TREVORTON

COMMUNICATION.

To His Excellency JOHN F. HARTRANFT.

Governor of the Commonwealth of Pennsylvania:

SIR:—In compliance with the requirements of an act of Assembly approved the fifth day of April, A. D. 1870, entitled "An Act for the preservation of the records of the inspectors of mines," etc., I have the honor to herewith submit my annual report of all data, matter and information that came to my notice, with carefully prepared lists of casualties and mortality, derived from proper sources of information, which is both of interest and import, furnishing the number and character of these casualties, fully detailed, the condition of the collieries and character of ventilation of the same, the system and plans adopted for mining of high dipping coal seams, and the numerous dangers incident to ill management of mines, the unskilled workingman and mine boss, and matters of general interest.

Your Excellency's attention, and that of the General Assembly, is most respectfully called to the conduct of the late examining board for this district, who, through their conduct, have deprived some eight thousand deserving miners and workingmen in Shamokin district of that protection guaranteed them by virtue of the act of March the third, 1870, of the services of an inspector of mines since the 22d of February last past. The casualties in this district appear to have increased. The clamor of the miners is urgent asking relief through your Excellency's interposition.

Such information as relates to casualties in Shamokin district I was obliged to obtain from private sources, but we may presume other casualties have occurred of which we have no authentic data.

Your Excellency will be pleased to learn that the services of the inspectors of coal mines in the other districts have accomplished good results. They have done much good, and even surpassed the most sanguine expectations of every friend of the measure.

The deep development of our coal seams greatly increases the dangers to life; the chances for exit and safety will be lessened, but while the Commonwealth exercises its present vigilance over the safety of our miners it is hoped the sacrifice of life will generally be diminished.

Annexed to this report please find the reports of each respective inspector, each detailing in full all statistical information relating to their districts, all of which are interesting and instructive.

The mortality and casualties that occurred during the year are each tabulated under their proper heads. The number of persons employed, the number of

steam engines in use, and the horse power of the same are given; and all the necessary information regarding the coal tonnage of the district, together with the deaths in each county and district, proportionate to the number of tons mined in the same, is carefully given.

Hoping, in furnishing your Excellency with such information, we may have performed our duty to your satisfaction,

I have the honor to be, with great respect,

Your obedient servant,

P. F. M'ANDREW, *Clerk.*

REPORT

OF THE

CLERK OF THE MINING DISTRICT OF SCHUYLKILL, 1872.

To the Senate and House of Representatives of the Commonwealth of Pennsylvania:

GENTLEMEN:—In compliance with the requirements of an act of General Assembly of the Commonwealth of Pennsylvania, approved the fifth day of April, 1870, entitled "An Act for the preservation of the records of the inspectors of coal mines in the mining district of Schuylkill, etc.," I have the honor to herewith submit my annual report of all data, matter and thing that came to my notice, carefully collected from official information, as required by the act referred to, together with such information furnished me by the inspectors of mines as is hereto annexed, relating to the number and character of the casualties, the condition of the collieries with regard to safety and ventilation, and such improvement as is required by the act of Assembly, etc. The subjects therein referred to are particularly interesting to our mining public.

European governments have enacted beneficial laws for the safety and health of their mining subjects. Its excellent effect has won for it the admiration and gratitude of this class of people. Your clemency has been lately aroused to the necessity of throwing around your mining public, and in full sympathy with their wants, have created laws adequate to afford relief, if properly administered, entitling you to the gratitude of your race for the many calamities that have been averted through the good offices of your inspectors of mines, as demonstrated in their different annual reports, on the visible decrease in every class of casualties connected with the working of coal within their respective districts.

I am constrained to bring to your notice another subject of very grave interest. This subject relates to a school of mining for the education, training and instruction of persons in the managing and working of coal mines. Ignorance and inexperience is at the root of most of our mine casualties. Our investigation of this subject clearly demonstrates this fact. The mine bosses, much like a number of their miners, are uneducated, and their judgment is generally at variance with correct principles; calculations with them is a matter beyond their comprehension. The training and discipline of the workingmen of a well managed mine should be equal to that of a military or naval force; but in the mine the enemy is omnipresent and more destructive, while ignorance and inexperience renders him more dangerous. The laggard, the impetuous, the heedless and ignorant, each prepares his own winding sheet and involves the lives of others as well as his own. The production of coal chiefly depends upon deep developments, and the dangers are multiplied correspondingly, hence, the great necessity of a practical knowledge of mining and mine management, for the safety of life and property, is indeed claiming your attention. There are features in the act of March, 1870, which contraventionalists boldly combat, and, if not successful, aids to retard the operation of the law. The costs and expenses created by defendants in cases arising under the processes of injunctions, etc., hitherto has been born by the Commonwealth. No provisions for the recovery of such costs appears to be made in the act.

A review of the annexed statistics will show a slight decrease in mortality and casualties generally. Careful attention to the collection of these statistics annually, will supply very interesting information.

I have the honor to be, with great respect,

Your obedient servant,

P. F. M'ANDREW, *Clerk.*

STATISTICS RELATING TO COLLIERIES.

The following statistics will show the various items of interest relating to the different colleries in the Pottsville and Ashland districts. The Shamokin district not being represented, but stands nearly as last year:

POTTSVILLE DISTRICT.	ASHLAND DISTRICT.
290 visits.	219 visits.
4,147 miles traveled.	3,012 miles traveled.
7,306 hands employed.	12,371 hands employed.
17 deaths.	42 deaths.
74 maimed.	89 maimed.
9 widows.	25 widows.
41 orphans.	68 orphans.
63 slopes worked.	57 slopes.
13 shafts worked.	8 shafts.
27 drifts worked.	75 drifts.
50 miles gangway.	67 miles gangway.
79 miles tracks.	122 miles tracks.
580 breasts worked.	1,741 breasts worked.
36 steam fans.	45 steam fans used.
708 horse power of fans.	958 horse power of fans used.
7 furnaces.	12 furnaces.
110 out-lets for ventilation.	100 out-lets for ventilation.
225 steam engines.	330 steam engines.
15,960 horse power of engines.	17,454 horse power of engines.
534 steam boilers.	674 steam boilers.
556 mules used.	975 mules used.
805 tenements.	2,360 tenements.
779 families.	2,417 families.
52 coal breakers.	72 coal breakers.
150 coal seams worked.	158 coal seams worked.

The above statistics are taken from reliable data: "*Inspectors' papers.*"

CASUALTIES IN THE YEAR 1872.

Casualties resulting in death or serious injury to persons employed in the mines of the district of Schuylkill, comprising the counties of Schuylkill, Northumberland, Columbia and Dauphin, respectively exhibit that 91 persons came to their deaths by injuries received while employed in and about the mines of the district; that of this number 62 were killed, and 29 others died of injuries; 49 of whom were married, 16 were unmarried, and 26 were under age, leaving 49 widows and 169 orphans.

That 265 persons were maimed and injured. That since the 22d of February, Shamokin district had no inspector. That some 8,000 persons employed at 66 collieries in that district were deprived, through the action of the examining board, of the services of the government inspector of mines. That from a careful investigation of the causes of such calamities, it is found that most of them arises from ignorance, inexperience and bad management, and that such conduct upon the part of the managers and workingmen cannot be too severely condemned, and should be restrained and abated by legal measures.

CASUALTIES IN THE SUB-DISTRICTS IN 1872.

Districts.	Killed.	Maimed.	Widows.	Orphans.	Total.
Pottsville		74	9	41	141
Ashland		89	25		224
Shamokin		102	15	60	209
Total	91	265	[illegible]	161	574

CASUALTIES IN THE SUB-DISTRICTS IN 1871.

Districts.	Killed.	Maimed.	Widows.	Orphans.	Total.
Pottsville	30	118	18	65	231
Ashland	56	168	24	97	345
Shamokin	43	120	24	95	282
Total	129	406		257	858

CASUALTIES IN SUB-DISTRICTS IN 1870.

Districts.	Killed.	Maimed.	Widows.	Orphans.	Total.
Pottsville	47	127	30	111	314
Ashland	62	93	38	121	314
Shamokin	21	78	1	48	160
Total	120	298	81	280	788

CASUALTIES IN SCHUYLKILL COUNTY FOR SEVEN MONTHS IN 1869.

	Killed.	Maimed.	Widows.	Orphans.	Total.
1869, Schuylkill county	56	86	30	150	322
1870, Schuylkill district	129	298	81	280	788
1871, Schuylkill district	129	406	66	257	858
1872, Schuylkill district	91	265	49	169	574
Total	405	1,055	226	856	2,542

ANNUAL CASUALTIES IN EACH SUB-DISTRICT FOR FOUR YEARS.

	Killed.	Maimed.	Widows.	Orphans.	Total.
Pottsville district in 1869	20	30	10	54	114
Pottsville district in 1870	46	127	30	111	314
Pottsville district in 1871	30	118	18	65	231
Pottsville district in 1872	17	74	9	41	141
Total	113	349	67	271	800
Ashland district in 1869	24	40	16	80	160
Ashland district in 1870	62	93	38	121	314
Ashland district in 1871	56	168	24	97	345
Ashland district in 1872	42	89	25	68	224
Total	184	390	103	366	1,043
Shamokin district in 1869	12	16	4	12	44
Shamokin district in 1870	21	78	13	48	160
Shamokin district in 1871	43	120	24	95	282
Shamokin district in 1872	32	102	15	60	209
Shamokin district in 3½ years	108	316	56	215	695
Ashland district in 3½ years	184	390	103	366	1,043
Pottsville district in 3½ years	113	349	67	271	800
Grand total	405	1,055	226	852	2,538

Annual Casualties compared, showing the increase or decrease in the Districts.

POTTSVILLE DISTRICT, IN FOUR YEARS.

Year.	Killed.	Increase or Decrease.	Killed.	Maimed.	Increase or Decrease.	Maimed.	Widows.	Increase or Decrease.	Widows.	Orphans.	Increase or Decrease.	Orphans.
1869	20	Not known		30	Not known		10	Not known		54	Not known	
1870	46	Increase	26	127	Increase	97	30	Increase	20	111	Increase	57
1871	30	Decrease	16	118	Decrease	9	18	Decrease	12	65	Decrease	46
1872	17	Decrease	14	74	Decrease	44	9	Decrease	9	41	Decrease	24
Total decr. 174	113	Decrease	29	349	Decrease	53	67	Decrease	21	271	Decrease	70

ASHLAND DISTRICT, IN FOUR YEARS.

Year.	Killed.	Increase or Decrease.	Killed.	Maimed.	Increase or Decrease.	Maimed.	Widows.	Increase or Decrease.	Widows.	Orphans.	Increase or Decrease.	Orphans.
1869	24	Not known		40	Not known		16	Not known		80	Not known	
1870	62	Increase	38	93	Increase	53	38	Increase	22	121	Increase	41
1871	56	Decrease	6	168	Increase	75	24	Decrease	14	97	Decrease	24
1872	42	Decrease	13	89	Decrease	79	25	Increase	1	68	Decrease	20
Total decr. 167	184	Decrease	19	390	Decrease	79	103	Decrease	14	366	Decrease	53

SHAMOKIN DISTRICT, IN FOUR YEARS.

Year.	Killed.	Increase or Decrease.	Killed.	Maimed.	Increase or Decrease.	Maimed.	Widows.	Increase or Decrease.	Widows.	Orphans.	Increase or Decrease.	Orphans.
1869	12	Not known		16	Not known		4	Not known		12	Not known	
1870	21	Increase	9	78	Increase	62	13	Increase	9	48	Increase	36
1871	43	Increase	22	120	Increase	42	24	Increase	11	95	Increase	47
1872	32	Decrease	11	102	Decrease	18	15	Decrease	9	60	Decrease	35
Total decr. 72	108	Increase	11	316	Increase	18	56	Decrease	9	215	Decrease	35

Schuylkill district coal tonnage for 1872, *giving the shipments and local consumption and totals in the counties of Schuylkill, Northumberland, Columbia and Dauphin, respectively:*

Counties.	Shipments.	Local consumption.	Gross total tons.
Schuylkill	4,130,593	1,181,000	5,311,593
Northumberland	1,221,327	170,000	1,391,327
Columbia	319,220	25,000	344,220
Dauphin	450,328	40,000	490,328
Total	6,121,468	1,416,000	7,547,468

County proportionate tonnage to each casualty:

Schuylkill county, 1 person lost a life for each..... 78,981 tons mined.
Northumberland county, 1 person lost a life for each..... 138,132 "
Columbia county, 1 person lost a life for each..... 49,174 "
Dauphin county, 1 person lost a life for each..... 61,290 "

Pottsville district tonnage is 1,665,804 tons proportion to each casualty.

For each 97,988 tons mined 1 person lost a life.
For each 22,511 tons mined 1 person has been maimed.
For each 185,089 tons mined 1 person became a widow.
For each 40,629 tons mined 1 person became an orphan.

Ashland district tonnage is 3,000,000 tons proportion to each casualty.

For each 82,053 tons mined 1 person lost a life.
For each 38,721 tons mined 1 person has been maimed.
For each 137,851 tons mined 1 person became a widow.
For each 50,679 tons mined 1 person became an orphan.

Shamokin district tonnage is 2,425,431 tons proportion to each casualty.

For each 75,795 tons mined 1 person lost a life.
For each 23,788 tons mined 1 person has been maimed.
For each 161,695 tons mined 1 person became a widow.
For each 40,424 tons mined 1 person became an orphan.

The coal tonnage of the respective counties has been kindly furnished me by Messrs. Bannan & Ramsey, editors *Miners' Journal*, which is the most reliable source of information upon that head.

COUNTY CASUALTIES FOR THE LAST FOUR YEARS.

	SCHUYLKILL.				NORTHUMBER'D.				COLUMBIA.				DAUPHIN.			
	Killed....	Maimed..	Widows..	Orphans.	Killed....	Maimed..	Widows..	Orphans.	Killed....	Maimed..	Widows..	Orphans.	Killed....	Maimed..	Widows..	Orphans.
In 1869, 7 months	56	86	30	150	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
In 1870	112	252	70	250	14	35	7	26	2	9	1	....	1	2	1	2
In 1871	102	339	57	162	20	54	8	26	2	.....	....	.....	6	14	1	6
In 1872	66	226	39	128	10	26	4	16	7	10	3	12	8	13	3	11
Total	336	893	196	690	44	115	19	68	11	19	4	12	15	29	5	19

DISTRICT COAL TONNAGE FOR FOUR YEARS, AND THE PROPORTIONATE TONNAGE TO EACH CASUALTY.

In 1869, 4,688,904 tons.	In 1870, 3,938,429 tons.	In 1871, 5,850,000 tons.	In 1872, 7,537,468 tons.	Total, four years, 22,014,801 tons.
81,944—1 death.	35,161—1 death.	45,341—1 death.	83,829—1 death.	54,357—1 death.
51,526—1 inju'd.	15,628—1 injur'd.	14,408—1 injured	24,669—1 inju'd.	20,866—1 injured
151,296—1 widow	54,700—1 widow.	88,636—1 widow.	153,826—1 widow	97,410—1 widow.
31,259—1 orph'n	15,628—1 orphan.	22,762—1 orphan.	44,600—1 orph'n	25,718—1 orphan.
239—1 emp'd.	187—1 empl'd.	197—1 empl'd.	247—1 emp'd	180—1 empl'd.

MONTHLY CASUALTIES IN THE DISTRICT OF SCHUYLKILL IN THE YEAR 1872.

Months.	Killed.	Maimed.	Widows.	Orphans.	Totals.
January	3	1	2	2	8
February	1	3	1	5	10
March	5	14	4	10	33
April	15	49	6	14	84
May	8	30	6	29	73
June	14	18	6	28	66
July	10	28	4	6	48
August	8	41	2	11	62
September	7	19	6	26	58
October	8	26	4	15	53
November	7	22	6	21	56
December	5	14	2	2	23
Totals	91	265	49	169	574

TONNAGE OF THE ANTHRACITE REGION IN 1872.

The quantity mined in each county, proportioned to the number of deaths and injuries during the year, as follows:

COUNTIES.	Tons mined.	Tons per death.	Tons per injured.
Schuylkill	5,311,593	78,981	24,590
Columbia	344,220	49,174	22,743
Northumberland	1,391,327	138,132	34,422
Dauphin	490,328	61,290	37,717
Luzerne	10,791,171	100,800	31,900
Carbon	4,110,674	164,400	108,100
Total anthracite mined	22,449,313		

TONNAGE OF THE ANTHRACITE REGION IN 1871.

The quantity mined in each county, proportioned to the number of deaths and injuries that year.

Counties.	Tons per killed.	Tons per injured.
Schuylkill	50,000	15,000
Northumberland	47,000	25,000
Columbia	258,000	518,000
Dauphin	88,500	38,000
Carbon	94,000	70,000
Luzerne	66,000	49,000

Recapitulation of deaths and injuries in the anthracite region for the year ending December 31, A. D. 1872.

Counties.	Killed.	Maimed.	Widows.	Orphans.	Aggregate casualties.
Schuylkill	66	216	39	129	450
Northumberland	10	26	4	16	56
Columbia	7	10	3	12	32
Dauphin	8	13	3	11	35
Carbon	25	38	11	33	107
Luzerne, east	40	121	21	119	301
Luzerne, west	67	185	28	61	341
Total casualties	223	609	109	381	1,322

Tonnage of the anthracite coal region of Pennsylvania in 1872 was 22,447,313 tons, proportioned to casualties.

	Deaths.	Maimed.	Widows.	Orphans.
Anthracite region	100,660 tons.	36,859 tons.	205,938 tons.	58,517 tons.

CHARACTER OF DEATH CASUALTIES IN SCHUYLKILL DISTRICT IN 1872.

Casualties of the deaths are as follows, viz:

25 persons were killed by falls of coal.
9 .....do.....do.....falls of rock and top slate.
4 .....do.....do.....falls into rolls, screens and machinery.
17 .....do.....do.....explosions of gas.
3 .....do.....do.....explosions of powder.
1 .....do.....do.....discharges of blasts.
14 .....do.....do.....being crushed by mine wagons.
3 .....do.....do.....being crushed by mine timbers.
12 .....do.....do.....falling in slopes, shafts and cogs.
3 .....do.....do.....suffocation.

91 persons lost their lives in and about the mines of the district.

CHARACTER OF THE INJURIES SUSTAINED IN SCHUYLKILL DISTRICT IN 1872.

63 persons were maimed by falls of coal.
10 .....do.....do.....falls of rocks and slate.
91 .....do.....do.....being burned by explosions of gas.
11 .....do.....do.....being burned by explosions of powder.
12 .....do.....do.....being burned by explosions of blasts.
29 .....do.....do.....being crushed by mine wagons.
4 .....do.....do.....being crushed by mine timbers.
4 .....do.....do.....being crushed by wheels, belts and machinery.
5 .....do.....do.....rollers.
5 .....do.....do.....falling off cage.
5 .....do.....do.....fall in slopes and shafts.
1 .....do.....do.....explosion of steam boiler.
2 .....do.....do.....falling of mules.
16 .....do.....do.....falling in schutes, breasts, etc.
2 .....do.....do.....falling on a circular saw.
5 .....do.....do.....sundry causes.

265 persons were maimed, — of whom died subsequently of their injuries.

CHARACTER OF THE INJURIES SUSTAINED.

2 persons lost an arm each.
1 person lost both arms.
10 persons had each an arm broken
2 persons had each both arms broken.
4 persons lost a leg each.
2 persons lost both legs each.
36 persons had each a leg broken.
2 persons had each both legs broken.
1 person lost an eye.
2 persons lost both eyes each.
9 persons had each their hands crushed.
3 persons had each their fingers cut off.
3 persons had each their foot crushed.
1 person had his toes cut off.
4 persons had each their persons crushed.
13 persons had each their heads crushed.
— lost a leg and arm.
3 persons had each their backs broken.
72 persons sustained injuries by explosions of gas.
95 persons sustained other injuries.

265 total number of persons who sustained injuries.
27 total number of persons who died of their injuries.
568 total number of casualties this year, to 858 do. last year.

COAL MINE CASUALTIES COMPARED WITH CASUALTIES DISCONNECTED FROM COAL MINING IN THE DISTRICT.

In and about mines:	*Other than at coal mines.*
91 persons killed.	65 persons killed, dec'd and suicided.
265 persons maimed and injured.	118 persons maimed and injured.
49 persons widowed.	31 persons widowed.
169 persons orphaned.	109 persons orphaned.
574 mine accidents.	323 county accidents.

List of names of persons killed or died of their injuries in and about the mining district of Schuylkill, comprising the counties of Schuylkill, Northumberland, Columbia and Dauphin, together with the number of widows and orphans in said district, for the year ending December 31, A. D. 1872.

Date.	Names of persons killed.	Names of the collieries.	Widows.	Orphans.	Character of injuries.
Jan. 1	Henry Beyerly	Montilius	1	2	Suffocated by gas in a breast.
1	A miner	Honey Brook	1	2	Killed in the mines by a fall of coal.
9	Abraham King, 3 persons.	Lentz & Bowman	1		Killed—scull broken by a fall of coal.
Feb. 20	John D. Jinkins, 1 person.	Mine Hill Gap	1	5	Killed by falling down the slope.
March 7	Patrick Ballard	Focht & Whittaker	1		Killed by a fall of coal.
21	Hugh O'Hara	Tunnel			Killed in the slope by breaking of the chain.
23	John Branan Hardi	Glen Carbon	1	6	Died from injuries—fall in the slope.
23	Owen Cannon	Wm. Penn shaft	1	3	Killed in the mines by a fall of coal.
23	Thomas M'Closkey, 5 persons.	Focht & Whittaker	1	1	Killed by a cage falling on him.
April 1	Thomas A Davis	Primrose	1	1	Killed in the mines by a fall of coal.
1	James Tones	Colkett			Died of injuries received in the mines.
3	Edward Downs	Big Lick	1	4	Killed by a fall of loose rocks.
6	John Harler	Indian Ridge			Killed by a fall of coal.
10	Dan. Miller	Williamstown	1		Killed—run over by wagons on the plane.
10	John Murry, (boy,)	Thomaston			Died—burnt by an explosion of gas.
14	John Davis	Taylorville			Killed by the slope cage.
17	Jenkins Cranage	Locust Run			Died—burnt by an explosion of gas.
17	George Cranage	do.			Died—burnt by an explosion of gas.
17	Thomas Hodjins	Honey Brook	1	4	Died suddenly while at work.
23	John Moore	Williamstown			Killed in the mine by a fall of top rock.
23	John M'Cann	do.			Killed in the mine by a fall of top rock.
23	Frederick Henderline	do.			Killed in the mine by a fall of top rock.
25	John Minahan	Otto Red Ash			Killed by an explosion of gas.
27	John D. Bowen, 15 persons.	Locust Dale	1	2	Killed by the discharge of a blast.
May 3	Philip Rilley	Honey Brook	1	2	
5	Martin Kelly, (boy,)	Beechwood.			
8	James Sherrin	Schmoleys	1	6	Killed—fell off the wagon in coming out.

List of Names of Killed and Injured—*Continued.*

Date.	Names of persons killed.	Names of the collieries.	Widow's.	Orphans.	Character of the injuries.
May 19	Patrick Haley	Lehigh, No. 3	1	6	Died—burnt by an explosion of powder.
24	James Deggan	Excelsior	....	....	Killed by a fall of coal.
27	Casmer Ratvstiki	Burnside	1	6	Killed by a fall of coal.
29	Thomas Wilson	Pine Forest shaft	1	5	Killed by a fall of coal.
29	Michael Corcoran	Locust Run	1	4	Killed—run over on the dirt plane.
	8 persons.				
June 1	Patrick Narey	Girardsville	....	....	Crushed to death in the rollers.
1	Michael Clarey	Indian Ridge	1	2	Died—injured by a fall of coal.
1	Philip Winter	Koh noor	1	4	Killed by a fall of coal.
4	Isaac Meyers	Williamstown	...	....	Killed—run over on the dirt bank.
5	Thomas Monaghan	Colkett	1	8	Killed by a fall of coal.
6	John M'Quade	Kohinoor	....	....	Killed—fell 325 feet down the shaft.
7	Daniel O'Connor	Gilberton	....	....	Killed in the mines by a fall of coal.
10	Paul O'Neil	Locust Dale	1	6	Killed by a fall of trestling.
12	James Harris	Cameron	....	....	Killed by a fall of slate.
13	John Crozier	Gilberton	....	....	Killed by the pump rods.
13	Patrick Roach	West Lehigh	1	4	Killed by a fall of coal.
13	George Gregor	Gilberton	....	....	Killed by a wagon falling on him.
19	John Weekes	Trenton	....	....	Crushed to death in the rollers.
	13 persons.				
July 1	Patrick Kelly	Locust Run	....	....	Killed by wagons and slope collars.
12	Thomas Earls	Brookside	....	....	Killed by wagons and prop timbers.
12	Henry Haberly	Ravensdale	1	6	Killed by a fall of coal.
13	Frank Esterline	Lykens Valley	....	....	Killed by falling off a dirt bank on a wall.
16	Anthony M'Anolty	Ellengowen	1	....	Killed by falling off a slope wagon.
19	Michael Ford	Lower Rauch Creek	....	....	Killed by a fall of rocks.
20	Thomas Davidson	Draper, Gilberton	1	....	Killed by falling off the slope wagon.
23	John Wise	Daniel Webster	....	....	Killed in the breaker rollers.
24	John Bell	Thomaston	...	..	Killed—run over in the mines by wagons.
24	John Higgins	West Lehigh	1	4	Killed by a fall of coal.
	10 persons.				
Aug. 8	John Walsh	Kohinoor	....	....	Killed by the cage in the shaft.
8	Richard Fitzpatrick	Elmwood	....	....	Died—burnt by an explosion of powder.
14	John Culbert, (boy,)	Lower Rauch Creek	....	....	Killed by an explosion of gas.

.....	Richard Culbert, (boy,)...	Lower Rauch Creek.....	.....	.....	Died—burned by an explosion of gas.
15.....	Charley Whittle.....	Williamstown	1	7	Killed by a slip of coal.
22	Martin Whalen.....	Lehigh, No. 3..	.....	.....	Killed in slope, the truck tilting over.
22.....	John M'Cormack.....	Lehigh, No. 3.....	1	4	Killed in slope, the truck tilting over.
28	Michael Haughney..... 8 persons.	Glen Carbon.....	.....	.....	Killed by a revolving screen.
Sept. 1.....	John Walsh	East Pine Knot.....	1	6	Killed by an explosion of gas.
.....	Owen Jones	St. Clair shaft.....	1	4	Died—burned by an explosion of gas.
11	James Roberts.....	East Mine shafts...	1	4	Killed by falling down the new shaft.
18	John Cunningham	Otto Red Ash.....	1	5	Died—burned by an explosion of gas.
20.....	Michael M'Glaughlin.....	Gilberton	1	3	Died—injured by a fall of rocks.
20	Jos. Waranouski.....	Draper, Gilberton.....	.....	.....	Killed by coupling mine wagons.
27.....	John Thomas..... ..... 7 persons.	Diamond	1	4	Died—burned by an explosion of gas.
Oct. 7.....	Conrad Hostel	Hill & Harris	1	4	Killed by a fall of coal.
7	Michael King.....	Plank Ridge	.....	.....	Killed by a fall of coal.
7.....	Dennis Daugherty	Union, E. Bast	1	3	Killed by a fall of coal.
1	James Murry, (boy,).....	Diamond	.....	.....	Died—burned by an explosion of gas.
1.	John Eddy	Buck Ridge..	1	2	Killed by a fall of coal.
17.....	Charles Walker	High Mines..	.....	.....	Killed by falling down the slope.
1.	John Edwards, (boy,).....	Mt. Carmel	.....	.....	Killed by a fall of coal.
2.	Richard O'Neil, (boy,).....	St. Clair shaft.....	.....	.....	Killed by a fall of slate.
2.....	Joseph Yust, (boy,)..... 9 persons.	Eagle.....	.....	.....	Killed by a fall of slate.
Nov. 2.....	Bartly Conners.....	Locust Mt'n C. & I. Co..	1	6	Died from effects of an explosion of powder.
5.....	Patrick Kirregan.....	Lost Creek	1	2	Died from effects of a fall of coal.
8.....	Thomas Keating	Otto White Ash....	.....	.....	Died from effects of an explosion of gas.
8... ..	Owen King.....	Raven Run	1	4	Killed by falling into the shaft.
8	Henry Beese	Otto White Ash.....	1	2	Died—burned by gas.
27.....	—— Quilliam.....	Eagle Hill shaft	1	.....	Suffocated by afterdamp.
27.....	Timothy Collins . ... 7 persons.	Lentz & Bowman	1	4	Killed by a fall of coal.
Dec. 12	Benjamin Hill	Lentz & Bowman.....	.....	.....	Killed in spraging wagons.
13.....	Peter Crebbs	Swatara.....	.....	.....	Killed by a fall of coal.
13.....	Edward Jones	Daniel Webster.....	.....	.....	Died—burned by an explosion of gas.
17.....	Henry. Williams.....	Heckscherville	.....	.....	Killed—fell into slope in cutting ice.
17	Henry Beese..... ..... 5 persons.	Otto White Ash.....	1	4	Burned by gas, November 8—died of injuries.

Ninety-one persons were killed or died of injuries, twenty-three of whom were persons under twenty years of age; leaving forty-nine widows and one hundred and sixty-nine orphans.

TABLE OF INJURIES.

Names of persons employed in and about the coal mines of the mining district of Schuylkill whose casualties resulted in death, maiming and injury, for the year ending December 31, A. D. 1872.

Date.	Names of persons injured.	Names of the collieries.	Remarks.
Feb. 9,	David Bowman..	Lentz & Bowman	Leg broken in the mines.
16,	Job Mitchell	Glen Carbon	Slightly burnt by an explosion of gas.
26,	Samuel Shane.... 3 persons.	Silver Creek	Leg broken by a fall of coal.
Mar. 12,	Jno. Raudabush,	Otto Red Ash	Severely burnt by an explosion of gas.
12,	John Larkin	Otto Red Ash.....	Severely burnt by the same explosion.
12,	John Griffith.....	Otto Red Ash.....	Severely burnt by the same explosion.
12,	David Davis.	Otto Red Ash.....	Severely burnt by the same explosion.
12,	John Kavanagh..	Otto Red Ash.....	Severely burnt by the same explosion.
12,	John Thomas.....	Otto Red Ash.....	Severely burnt by the same explosion.
14,	The boss at.....	Mammoth Shaft,	Leg broken (double) by a fall of rocks.
15,	Thos. Connor.....	Plank Ridge.....	Severely injured by a fall of coal.
18,	Wm. M'Keon....	Plank Ridge.....	Severely injured by a fall of coal.
18,	John Hartman...	Plank Ridge.....	Foot broken by a fall of coal.
20,	Thomas Fannon,	Phœnix, No. 3...	Severely burnt by an explosion of gas.
20,	John O'Neil.....	Phœnix, No. 3...	Severely burnt by an explosion of gas.
25,	Thomas Johns....	Eagle.....	Severely burnt by an explosion of gas.
25,	James Blecker...	Eagle.....	Severely burnt by an explosion of gas.
28,	J. A. Goodman...	Swift Creek	Severely burnt by an explosion of gas.
28,	Chas. Goodman.. 16 persons.	Swift Creek	Severely burnt by an explosion of gas.
Apr. 4,	Dan'l Miller.	Williamstown ...	Mortally injured by a wagon.
4,	Lyb'd F. Nolen..	Williamstown ...	Severely burnt by an explosion of gas.
4,	John Williams...	Locust Dale.....	Severely burnt by an explosion of gas.
4,	George Bevan	Locust Dale.	Severely burnt by an explosion of gas.
4,	Andrew Sitzer.	Locust Dale.....	Severely burnt by an explosion of gas.
4,	Joan Monroe.....	Locust Dale.	Severely burnt by an explosion of gas.
4,	James Macks.....	Locust Dale.....	Severely burnt by an explosion of gas.
4,	Frank Branan ...	Locust Dale..	Severely burnt by an explosion of gas.
4,	Enoch Thomas...	Locust Dale.....	Severely burnt by an explosion of gas.
4,	James Madden...	Locust Dale.....	Severely burnt by an explosion of gas.
4,	Jenk's Granage..	Locust Dale.....	Fatally burnt by an explosion of gas.
4,	Geo. Granage.....	Locust Dale.....	Fatally burnt by an explosion of gas.
4,	Storis Waldron...	Henry Clay.....	Severely injured by a fall of slate.
4,	John Helper	Henry Clay.....	Severely injured by a fall of slate.
4,	Joseph Merkle...	Mentilius.....	Severely injured by explosion of powder
5,	John Jones.....	Pine Forest.....	Severely burnt by an explosion of gas.
5,	John Morris.....	Pine Forest.....	Severely burnt by an explosion of gas.
6,	Michael Keller...	Union.....	Severely burnt by explosion of powder.
6,	William Daily...	East Pine Knot..	Thigh broken by a fall of coal.
8,	Samuel Hearter,	Colkett.....	Severely injured by an explosion of gas.
8,	Jas. Sheehan.....	L. Rauch Creek..	Severely injured by an explosion of gas.
10,	John Sheaffer.....	Red Mountain ...	Severely injured by fall in the slope.
10,	A miner.	Franklin.....	Severely burnt by an explosion of gas.
15,	Elias Feler.....	Hill and Harris..	Mortally injured; dragged by wagons.
15,	James Duffy	Turkey Run	Severely injured; fall of coal.
15,	Thos. Murray.....	Thomaston.....	Mortally burnt by gas; died.
15,	John Keller..	Eagle.....	Mortally burnt by powder.
17,	John Kensely.....	L. Rauch Creek..	Severely injured by an explosion of gas.
26,	A miner.....	Taylorville.....	Severely burnt by an explosion of gas.
26,	A miner.....	Taylorville.....	Severely burnt by an explosion of gas.
27,	Martin Kelly.....	Beechwood.....	Mortally burnt by explosion of gas; died
27,	A fireman.	Hillside.....	Leg broken falling over a bank.
29,	Jas. Carpenter ...	Hillside.....	Leg broken falling off a building.
29,	Evan Argust.....	Otto Red Ash.....	Severely burnt by an explosion of gas.
29,	Evan Reese.....	Otto Red Ash.....	Severely burnt by an explosion of gas.
29,	John Prichard....	Otto Red Ash.....	Arm broken by an explosion of gas.
29,	David Davis.....	Otto Red Ash.....	Severely burnt by an explosion of gas.
29,	Benja'n Argus ...	Otto Red Ash.....	Severely burnt by an explosion of gas.
29,	Pat. Caniff	Otto Red Ash.....	Severely burnt by an explosion of gas.
29,	Daniel Colry.....	Otto Red Ash.....	Severely burnt by an explosion of gas.
29,	Martin Kelly.....	Otto Red Ash.....	Severely burnt by an explosion of gas.

TABLE OF INJURIES—*Continued.*

Date.	Names of persons injured.	Names of the colleries.	Remarks.
Apr. 29,	John M. Kelly...	Otto Red Ash.....	Severely burned by an explosion of gas.
29,	Frank Kerns	Otto Red Ash.....	Severely burned by an explosion of gas.
29,	James Joyce.....	Otto Red Ash.....	Severely burned by an explosion of gas.
29,	Joseph Schock...	Enterprise	Severely injured by a fall of coal.
30,	Thomas Leonard	Tamaqua shaft...	Severely burned by an explosion of gas.
30,	Patrick M'Corly,	Tamaqua shaft...	Severely burned by an explosion of gas.
30,	Patrick Kealing,	Colkett..	Severely burned by an explosion of powder.
30,	Charley Miller... 47 persons.	L. Rauch Creek..	Leg severely injured—run over by a wagon.
May 1,	John Roberts.....	Colkett.....	Mortally injured by a blast.
1,	Martin Brinan....	Pine Forest...	Severely burned by an explosion of gas.
1,	John M'Cafferty,	Honey Brook.....	Severely injured by a fall of coal.
1,	John B. Wright..	Tremont	Severely injured by wagons.
6,	James Golan	Union.....	Leg broken by a fall of coal.
8,	Charley Frumm,	Otto White Ash..	Arm brekon—run over by a wagon on dirt bank.
8,	E. P. Foulk.....	Shamokin.....	Ribs broken—fell down a breast.
9,	Henry H. Helt...	Shamokin.....	Crushed by wagons in the gangway.
10,	George Rothford	Ravensdale.....	Severely burned by an explosion of gas.
10,	G. Rothford, boy,	Ravensdale..... ..	Slightly burned by an explosion of gas.
10,	John Richards...	Tunnel Ridge.....	Severely injured by falling down a manway.
12,	David Reese.....	Primrose.....	Slightly injured by a fall of coal.
12,	Morg'n Williams	Greenwood.....	Severely burned by gas.
17,	John Tierney.....	Eagle.....	Eyes destroyed by coal discharged from a blast.
18,	J. Prenderghast,	Pine Knot.....	Eyes injured by coal.
18,	Samps. Cooch.....	Wm. Penn.....	Leg broken by a fall of coal.
18,	George Glenn.....	St. Clair shaft.....	Severely burned by an explosion of gas.
20,	Conrad Silbach...	Plank Ridge.....	Head severely cut by a fall of coal.
20,	Thos. O'Donnall,	Pine Forest.....	Severely burned by the discharge of a blast.
21,	Austin Lyons.....	Shenandoah.....	Arm broken by a fall of coal.
21,	Thomas Hughes,	Lehigh, No. 3.....	Head severely cut—fell down a schute.
21,	Patrick Devitt....	Shenandoah city	Knee severely cut by a fall of coal.
21,	Patrick Hannity,	Plank Ridge.....	Foot cut off by a fall of coal.
22,	Alex. Kieser.....	Williamstown ...	Severely injured by a fall of rocks.
22,	John Jones.....	Williamstown ...	Severely injured by a fall of rocks.
22,	Christ Yeofert....	Pine Forest.....	Slightly injured by an explosion of gas.
22,	James Davis.....	Pine Forest.....	Slightly injured by an explosion of gas.
22,	John H. Thomas,	Pine Forest.....	Slightly injured by an explosion of gas.
22,	John Morris.....	Pine Forest.....	Severely injured by an explosion of gas.
24,	Alick Anderson,	Beechwood.....	Severely injured by an explosion of gas.
24,	A miner.....	Beechwood.....	Severely injured by an explosion of gas.
24,	A miner.....	Beechwood.....	Severely injured by an explosion of gas
25,	John Lewis.....	Beechwood.....	Slightly injured by an explosion of gas
25,	Michael Cleary...	Indian Ridge.....	Arms broken by a fall of coal.
25,	John Taylor.....	Wiggans	Mortally burned by gas. Died June 1.
29,	W. Wilson, boy,	Pine Forest.....	Severely injured by a fall of coal.
29,	Chas. Newman... 37 persons.	Luke Fidler.....	Hand amputated by a fall of coal.
June 3,	John Moore.....	Tunnel Ridge.....	Severely injured — crushed by mine wagons.
3,	A boy..	Girardsville.....	Head badly cut by a fall of coal.
3,	A man.....	Girardsville..	Thigh broken by a fall of coal.
5,	Samuel Schell....	Colkett.....	Eyes destroyed by a blast.
5,	Jona. Stitzman...	Colkett.....	Slightly injured by a blast.
5,	John Derany.....	Girardsville.....	Mortally injured.
8,	Patrick Nevins...	Eagle Hill shaft..	Severely burned by an explosion of gas.
8,	A miner.....	Tunnel Ridge.....	Leg broken by a fall of coal.
8,	Charles Carroll...	Hill & Harris.....	Fingers cut off by wagons.
11,	Patrick Berrigan	Commercial.....	Arm amputated—crushed by timbers.
12,	Henry Wootten..	Lentz & Bowman	Head severely cut by a fall of coal.
12,	Pat. Nary, boy ...	Wm. Penn.....	Eyes injured by a blast.
13,	Hugh Golden.....	Otto Red Ash.....	Severely burned by an explosion of gas.
13,	Uriah Brown.....	Otto Red Ash.....	Severely burned by an explosion of gas.

TABLE OF INJURIES—*Continued.*

Date.	Names of persons injured.	Names of the collieries.	Remarks.
June 13,	Alfred De Long..	Luke Fidler.....	Leg broken by a fall of coal.
13,	Martin Madera...	Hickory Swamp,	Arm broken—run over by a dirt car.
19,	B. L. Eschelman 17 persons.	Preston, No. 2.....	Head severely cut by a fall of slate.
July 3,	Lawrence Egan .	Beechwood.....	Severely burnt by an explosion of gas.
3,	Peter Egan	Beechwood.....	Severely burnt by an explosion of gas.
6,	Samuel Tregoe...	Boston Run.....	Back crushed by a fall of coal.
8,	Pat'k Monaghan	Plank Ridge	Severely injured by a fall of coal.
8,	Patrick Ruddy...	Lost Creek.....	Head injured by a fall of coal.
8,	Josiah Gill	Plank Ridge	Leg broken by a fall of coal.
10,	James Jordan.....	Tunnel Ridge.....	Leg broken by a wagon.
11,	Thomas Bohan...	Eagle Hill shaft..	Severely burnt by an explosion of gas.
11,	Luke Hagerty ...	Eagle Hill shaft..	Severely burnt by an explosion of gas.
13,	Thomas Galvin...	Colorado.....	Legs broken by a fall of coal.
13,	John Lewis..	Coaldale.	Hand cut off by a fall of slate.
13,	Daniel Hughes...	Turkey Run	Hand cut by a fall of coal.
17,	Joseph Jones.....	St. Clair shaft	Severely burnt by an explosion of gas.
17,	Daniel Howles ...	St. Clair shaft	Severely burnt by an explosion of gas.
19,	Wm. Hartney.....	Tunnel	Thigh broken—crushed by a wagon.
19,	John W. Thomas	Big Lick	Arm broken by a fall of coal.
19,	An engineer	Eagle, No. 2.. ..	Severely scalded by a boiler explosion.
20,	Israel Rodgers ...	Plank Ridge	Slightly injured by a fall of coal.
20,	Phil. Imsewiller	Colkett.....	Severely burned by gas.
24,	Thomas Bane.....	St. Nicholas.....	Severely injured by falling off the cage.
24,	Hugh Evans	St. Nicholas.....	Severely injured by falling off the cage.
24,	James Walsh	St. Nicholas [ker	Severely injured by falling off the cage.
24,	A miner.	Focht & Whitta-	Leg broken by a fall of coal.
25,	John Higgins	West Lehigh.....	Severely crushed by a fall of coal.
25,	John Dolan	Cameron	Eyes destroyed by an explos'n of powder.
26,	John Williams...	Mammoth.....	Leg broken—run over by wagons.
26,	Thos. Richards...	Tunnel Ridge.....	Severely injured by a blast.
26,	David Oliver.....	Eagle Hill shaft..	Arm broken by fall of trestle-work.
26,	William Bale	Wiggan	Leg broken by a fall of coal.
29,	Henry Hunt ..... 30 persons.	Lentz & Bowman	Severely injured by a fall of props. [a keg of powder.
Aug. 5,	Robert Parkins ..	Buck Ridge.....	Head severely injured by explosion of
7,	T. Goldsworthy..	Glendon.....	Collar bone crushed by wagons.
8,	Albert Dennis.....	Elmwood	Severely injured in the mine.
8,	Rich. Fitzpatrick	Elmwood	Fatally injured by a blast—arm cut off.
8,	Matthew Schue..	Hillside.....	Head cut by a fall of coal.
9,	Jacob Daubler ...	L. Rauch Creek..	Severely injured by an explosion of gas.
12,	Jacob Koroeskia	Bear Valley.....	Severely injured by an explosion of gas.
12,	Wm. Lindemuth	Bear Valley.....	Severely injured by an explosion of gas.
13,	John Thomas.....	Taylorville	Severely injured by an explosion of gas.
13,	Wm. Jones.....	Taylorville	Severely injured by an explosion of gas.
14,	Richard Culbert,	L. Rauch Creek..	Mortally injured by an explosion of gas.
14,	James Valance...	Copley	Severely injured by a fall of coal.
17,	Christ. Rohrbach	Colkett.....	Head severely injured by a blast.
19,	Richard Bryant..	Furnace	Arm broken by a wagon.
22,	Martin Wheton..	Lehigh, No. 3.....	Seve'ly inj'd—fell off slope truck—died.
22,	John M'Cormack	Lehigh, No. 3.....	Seve'ly inj'd—fell off slope truck—died.
22,	Jas. Garraway....	Gilberton.....	Crushed badly by a fall of coal.
22,	George Barns	Beechwood	Foot lost—crushed in the cog-wheels.
22,	John Walsh.....	East Pine Knot ..	Severely burnt by an explosion of gas.
22,	Edward Murphy	East Pine Knot ..	Severely burnt by an explosion of gas.
23,	William Kyle.....	L. Rauch Creek..	Severely burnt by an explosion of gas.
23,	Wm. Kyle, Jr....	L. Rauch Creek..	Severely burnt by an explosion of gas.
23,	Daniel Harvey...	L. Rauch Creek..	Severely burnt by an explosion of gas.
23,	C. Meizeniger	Cambrian..	Seve'ly inj'd by breaking of slope chain.
24,	John Minchell ...	Lehigh, No. 3.....	Head and back sev'ly inj'd by fall of coal.
24,	Richard Kneicht	Lehigh, No. 3.....	Leg broken by a wagon.
24,	John M'Neal	Plank Ridge	Head severely cut by explos'n of a blast.
24,	Thos. Needham..	Plank Ridge	Hands seve'ly cut by explos'n of a blast.
24,	D. Fitzgerrold....	Plank Ridge	Hands seve'ly cut by explos'n of a blast.
24.	Thomas Youtz ...	Kohinoor...	Back severely cut by a fall of coal.
26,	John Greener.....	Kohinoor.....	Hand cut off by the circular saw.

TABLE OF INJURIES.—*Continued.*

Date.	Names of persons injured.	Name of the collieries.	Remarks.
Aug. 29,	Owen T. Jones...	St. Clair shaft....	Mortally burnt by explosion of gas—died.
29,	John Murry.....	St. Clair shaft.....	Leg crushed by wagons.
29,	————, (boy)	Otto Red Ash.....	Leg cut off—run over on dirt bank.
30,	James Kelleger..	Diamond No. 2...	Ribs broken by a fall of coal.
31,	D.Grumm,(boy)	St. Clair shaft.....	Burnt by an explosion of gas.
31,	William Roberts	St. Clair shaft.....	Burnt by an explosion of gas.
31,	Daniel Crow.....	Big Lick.....	Leg broken—run over by a dirt truck.
	38 persons.		
Sept. 4,	John Wilson.....	Boston Run.....	Arms broken—fell down a schute.
10,	James Roberts...	East Mine shafts	Mortally injured—fell down shaft—died.
12,	William Morgan	Lentz & Bowman	Head severely cut by a fall of coal.
16,	W. H. Jones	Glen Carbon	Injured by being crushed by wagons.
18,	Allen Walkins...	Spruce Forest.....	Leg cut off in the small rollers.
18,	Pat. M'Garvey...	Otto Red Ash.....	Severely burnt by an explosion of gas.
18,	Richard James...	Otto Red Ash.....	Severely burnt by an explosion of gas.
18,	David James.....	Otto Red Ash.....	Severely burnt by an explosion of gas.
18,	J. Cunningham..	Otto Red Ash.....	Mortally burnt by explosion of gas—died.
18,	Patrick Quinn ...	Otto Red Ash.....	Severely burnt by an explosion of gas.
18,	James Howells...	Otto Red Ash.....	Severely burnt by an explosion of gas.
18,	Jacob Gehress....	Otto Red Ash.....	Severely burnt by an explosion of gas.
18,	J. Warrens.....	St. Nicholas.....	Leg broken (amputated) by dirt wagon.
19,	F. A. Polander...	Buck Ridge.....	Severely injured by a fall of rocks.
27,	J. Prenderghast..	Forestville	Severely burnt by an explosion of gas.
27,	John Thomas.....	Forestville.....	Mortally burnt by explosion of gas—died.
27,	J. Murry, (boy,)	Forestville.....	Mortally burnt by explosion of gas—died.
27,	James Stitzer.....	Keystone..	Severely burnt by an explosion of gas.
	19 persons.		
Oct. 2,	Patrick Flynn....	Mt. Laffee.	
3,	Edward Brophy	Glen Carbon.	
8,	John Curran.....	East Pine Knot...	Severely injured by a fall of coal.
11,	J. Cunningham..	Girard	Severely injured—fell down the slope.
11,	John Ticee.....	Williamstown ...	Severely injured.
17,	—— Lewis, (boy)	Mt. Carmel.....	Severely injured by a fall of coal.
17,	A workingman...	Mt. Carmel.....	Severely injured by a fall of coal.
20,	Owen T. Jones...	St. Clair shaft.. ..	Severely burnt by gas.
23,	John Regan..	Ravendale	Severely burnt by gas.
23,	Patrick Murphy	Ravendale	Slightly burnt by gas.
23,	Andrew Tempus	Hickory shaft....	Leg broken by wagons.
24,	J. Calhouse.....	Bowman's.....	Leg broken by wagons.
28,	John Fegan.....	Eagle..	Leg broken by wagons.
28,	Griffith Smith....	Ravendale	Head and back injured—fell into schute.
28,	John B. Bush.....	Williamstown ...	Fatally injured—fell off a building.
28,	John Schmidt....	Henry Clay.....	Leg amputated—injured by elevators.
28,	Sam'l Donaldson	Colkett.....	Severely injured by a fall of coal.
29,	Michael Daylas..	Big Lick	Severely injured by gas.
29,	Wm. Barnes	Mt. Carmel.....	Head injured by a fall of coal.
29,	A miner.....	Mt. Carmel.....	Leg broken by a fall of coal.
29,	James Harris.....	Mt. Carmel...	Severely injured by a blast.
29,	Anthony Nary...	Mt. Carmel...	Hand injured by a fall of coal.
31.	F. M'Andrew.....	Beechwood.....	Scalp wound by a kick from a mule.
Nov. 2,	John Dooley.....	Locust Mountain	Severely burnt by explosion of powder.
7,	A. Rowland.....	Girardsville.....	Severely crushed by wagons—leg broken.
7,	James Killy.....	Diamond.....	Severely crushed by wagons.
9,	Anthony Barrett	Anthracite	Arm broken by a fall of coal.
15,	J. Wyle, (boy)..	Primrose.....	Arm crushed by rollers.
17,	John Quilliam...	Eagle Hill	Severely burnt by gas.
17,	Thomas Burns...	Charter Oak.....	Dangerously burnt by gas.
17,	Charles Reighter	Koh-i-noor	Dangerously injured by a fall of coal.
19,	John Mathews...	Plank Ridge.....	Dangerously injured by a fall of coal.
23,	Bart. Dillman....	Koh-i-noor	Dangerously cut by a circular saw.
27,	Patrick Jordan...	Lentz & Bowman	Triple break of leg.
Dec. 3,	Edward Jones....	Daniel Webster..	Dangerously burnt by powder.
3,	Davy Williams...	St. Nicholas.....	Dangerously burnt by powder.
5,	John Walsh.....	St. Nicholas.....	Leg broken—fell into a schute.
5,	Wm. Pooler..	Koh-i-noor	Eyes burnt by powder.
7,	Patrick Martin...	Short Mountain..	Arm broken by a fall of coal. [rope.
9,	Daniel Haley.....	Short Mountain..	Back severely injured, sliding on slope

TABLE OF INJURIES.—*Continued.*

Date.	Names of persons injured.	Name of the collieries.	Remarks.
Dec. 9,	Frank Buckley..	Tunnel Ridge.....	Head severely injured by a fall of coal.
9,	Christian Foster,	Tunnel Ridge.....	Severely injured by a fall of coal.
9,	Christian Post....	Tunnel Ridge.....	Severely injured by a fall of coal.
12,	David Lewis.....	Shoemaker's.....	Head severely injured by a fall of rocks.
12,	Pat. M'Anulty...	Mahanoy City....	Severely injured by a fall of coal.
12,	Patrick Ryan.. ..	Mahanoy City....	Severely injured by a fall of coal.
19,	James Smith.....	No. 8.....	Mortally injured—caught in machinery.
19,	Robert Dillon.....	East Mahanoy ...	Arm broken in the mines.
19,	Westly Yhoe.....	Mahanoy City....	Foot crushed in rollers—died 20th Dec.
28,	Henry Bolton.....	No. 10.....	Leg & arm broken—crushed by wagons.
28,	Kern Maugan.....	Ellengowen.....	Ribs broken—fell into the shaft.

265 persons were injured, 27 of whom died of their injuries.

CASUALTIES IN POTTSVILLE MINING DISTRICT, RESULTING IN DEATHS AND INJURIES, IN 1872.

Name of colliery.	Location.	Killed....	Died	Injured..	Total.....
Mine Hill Gap.....	Mine Hill Gap..	1	.....	.....	1
Glen Carbon.....	Mackeysburg.....	2	.....	3	5
Thomaston	Thomaston.	2	.....	1	3
Taylorville..	Taylorville	1	.....	3	4
Beechwood.....	Mount Laffee.....	1	.....	12	13
Pine Forest shaft.	St. Clair.....	.....	1	9	10
East Pine Knot.....	Greenburg.....	1	.....	5	6
St. Clair shaft	St. Clair	2	1	9	12
P. R. C. & I. Co.'s shaft.....	East Mines.....	.....	1	2	3
High Mines.	Tamaqua	1	.....	.....	1
Eagle.	St. Clair.....	.....	1	6	7
Eagle Hill shaft.....	Eagle Hill.....	.....	1	6	7
Silver Creek.....	Silver Creek..	.....	.....	1	1
Swift Creek	Tuscarora.....	.....	.....	2	2
Tamaqua shaft	Tamaqua.	.....	.....	2	2
Greenwood..	Tamaqua East	.....	.....	2	2
Commercial	New Philadelphia	.....	.....	2	2
Coal Dale slope..	Coal Dale	.....	.....	1	1
Oak Hill.....	Norwegian.....	.....	.....	2	2
Spruce Forest	New Castle	.....	.....	2	2
Kentucky slope	Tuscarora.....	.....	.....	1	1
Anthracite	Tamaqua	.....	.....	1	1
Buller.....	Combola.....	.....	.....	1	1
Bull Run, No. 10.....	Bull Run.....	.....	.....	1	1
Raven Dale.	....	.....	.....	1	1
Heckscherville slope.....	Heckscherville	1	.....	.....	1
Total casualties in 1872 was.....		17	74	62	92
Total casualties in 1871 was.....		30	118	.....	148
Total casualties in 1870 was		46	127	.....	173

The above results are very gratifying, showing the annual decrease in the mortality and casualties of the district are greatly on the decline.

CASUALTIES IN ASHLAND MINING DISTRICT, RESULTING IN DEATH AND INJURIES, IN 1872.

Name of colliery.	Location.	Killed	Died	Injured	Total
St. Nicholas	St. Nicholas			6	6
Copley	Mahanoy City	3		1	4
Focht & Whittaker.	Mahanoy City	2		1	3
Tunnel	Ashland	1		1	2
Primrose	Mahanoy City.	1		2	3
Indian Ridge	Shenandoah City	1	1	1	3
Locust Dale	Columbia county	2	2	10	14
Honey Brook	New Pottsville	1	2	1	4
Lehigh, No. 3	Shenandoah, West	1	1	5	7
Locust Run	Ashland	1	1		2
Girardsville	Girardsville	1			1
Koh-i-noor shaft	Shenandoah, West	3		5	8
Bear Run	St. Nicholas	1		2	3
Gilberton	Gilberton	1	2	1	4
West Lehigh	Shenandoah, West	1	1		2
Trenton	Near Delano		1		1
Ellen Gowan	Maple Dale		1	2	3
Draper	St. Nicholas	2		3	5
Elmwood	Mahanoy City		1	1	2
Mahanoy City slope	Mahanoy City	1		4	
Turkey Run	Shenandoah City			1	
Union	Big Mine Run	1		2	
Cuyler	Raven Run	1			1
Lost Creek	Near Colorado		1	1	2
Wm. Penn shaft	Near Colorado	1		2	3
Plank Ridge	Shenandoah City			13	3
Hillside	Mahanoy City			5	5
Shenandoah, West	Shenandoah City			2	2
Tunnel Ridge	Mahanoy City			10	10
Girardsville	Girardsville			5	5
Keystone	Ashland, West			1	1
Hazle Dell	Centralia	1		1	2
		27	14	89	130
Total casualties in Ashland district in 1872 was		41		89	130
Total casualties in Ashland district in 1871 was		56		168	224
Total casualties in Ashland district in 1870 was		62		93	155

CASUALTIES IN SHAMOKIN DISTRICT RESULTING IN DEATH AND INJURIES IN THE YEAR 1872, AS FAR AS HEARD OF.

Name of colliery.	Location.	Killed	Died	Injured	Total
Stewartsville	Stewartsville	1		1	2
Colkett	Donaldson	1	1	6	8
Big Lick	Williamstown	1		4	5
Williamstown slopes	Williamstown	6	1	8	15
Otto slopes	Branch Dale	1	3	29	33
Black Diamond	Schmœlie's	1		2	3
Excelsior	Shamokin	1			1
Burnside	Shamokin	1			1
Cameron	Trevorton	1		3	4
Brookside	Tower City	1		2	3
Lower Rauch Creek	Rauch creek	2	1	10	13
Daniel Webster	Shamokin	1	1	1	3
Diamond, No. 2	Forestville		2	5	7
Buck Ridge	Mt. Carmel	1		3	4

CASUALTIES IN SHAMOKIN DISTRICT—*Continued.*

Name of colliery.	Location.	Killed....	Died	Injured..	Total.....
Mt. Carmel	Mt. Carmel	1	.....	4	5
Locust Mountain C. & I. Co...	Near Mt. Carmel	1	.....	2	3
Phœnix, No. 3	Phœnix Park	.....	.....	2	2
Red Mountain	Tremont	.....	.....	2	2
Franklin	Tremont	.....	.....	1	1
Tremont	Donaldson	.....	.....	1	1
Henry Clay	Shamokin	.....	.....	3	3
Enterprise	Shamokin	.....	.....	1	1
Eureka	Donaldson	.....	.....	1	1
Tremont Coal Company	Donaldson	.....	.....	1	1
Shamokin	Shamokin	.....	.....	3	3
Luke Fidler	Shamokin	.....	.....	3	3
Hickory Swamp	Shamokin	.....	.....	2	2
Bear Valley	Shamokin	.....	.....	2	2
New Town	Swatara	1	.....	.....	1
Otto White Ash	Branch Dale	.....	1	.....	1
Total casualties as far as learned		22	10	102	134
Total casualties in Shamokin district in 1872		32	.....	102	134
Total casualties in Shamokin district in 1871		43	.....	120	163
Total casualties in Shamokin district in 1870		21	.....	78	99

The casualties are greater in the district. Inspectors' reports ceased since February 22, 1872.

COLLIERY DEATHS, &C., COMPARED WITH ENGLAND.

In England in 1871, there was one death to each 109,945 tons of coal mined.

In the Pennsylvania anthracite regions in 1872, there was one death to each 99,276 tons mined, and an accident to each 36,194 tons mined.

In England there were 318 tons of coal mined in 1871 for each person employed at the collieries.

In 1872 in the counties of Schuylkill, Northumberland, Columbia and Dauphin there were 256 tons produced for each person employed.

In Luzerne district in 1872, there were 426 tons produced for each person employed.

In Carbon district in 1872, there were —— tons produced for each person employed at the collieries.

This statement shows that those employed in the Schuylkill district did not work regularly; and it may be presumed a considerable number were reported who were making improvements which yielded very little produce in coal tonnage, as the product per person employed is not much over half the product of each person employed in the Luzerne district.

PRODUCT OF BELGIAN COAL.

The following was the prpduct in the last seven years:

In 1852	6,795,368	tons	produced.
In 1862	9,877,146	"	"
In 1867	12,787,343	"	"
In 1868	11,755,956	"	"
In 1869	12,959,704	"	"
In 1870	13,496,564	"	"
In 1871	13,671,470	"	"

Showing the product doubled in twenty years.

County Coal Tonnage for 1872.

Schuylkill County.

Names of collieries.	Locations.	Land owners.	Names of operators.	Tons coal mined.
Butler..	Silver Creek	Swayne & Able	Winlack & Co.	11,574
Eagle shaft	Eagle Hill.	P. R. C. and I. Co.	J. C. Oliver & Co	59,763
Norwegian.	Mt. Laffee.	P. R. C. and I. Co.	J. Buckley	Idle.
Glen Carbon	Glen Carbon	P. R. C. and I. Co.	John Lucas	64,067
Feeder Dam	Mill Creek	P. R. C. and I. Co.	Wm. Murry.	10,539
Commercial	New Philadelp'a	P. R. C. and I. Co.	Wm. Kendrick	9,173
East Mine	East Delaware	P. R. C. and I. Co.	Wm. Kendrick	60
St. Clair shaft	St. Clair	P. R. C. and I. Co.	Wm. Kendrick	73,236
Coaldale slope	Coaldale	Lehigh C. & N. Co.	L. C. and N. Co.	60,500
East Pine Knot	Greenb'y Valley	P. R. C. and I. Co.	Wm. Kendrick	46,987
Black Heath	St. Clair	P. R. C. and I. Co.	A. Jackson	2,138
Manchester	Wadesville	P. R. C. and I. Co.	Alden & Co.	4,359
Spruce Forest	New Castle	G. Richardson.	J. Dennings	1,663
Ravendale	Ravendale	P. R. C. and I. Co.	Wm. Starr	54,262
Diamond	Eagle Hill.	P. R. C. and I. Co.	Diamond C. Co.	7,560
Ellsworth.	New Castle.	P. R. C. and I. Co.	J. R. Davis	286
Mammoth vein	West Castle	R. R. C. and I. Co.	J. Dennings	317
Bullock	Minersville	Bullock & Bros.	J. H. Thomas	2,078
Glen Dower.	Glen Carbon	P. R. C. and I. Co.	Wm. Kendrick	40,477
Eagle	St. Clair	P. R. C. and I. Co.	G. W. Johns	70,142
Tamaqua shaft	Tamaqua	P. R. C. and I. Co.	Macky Walker	16,834
Forestville.	Forestville	P. R. C. and I. Co.	D. Hock & Co.	19,601
Monitor	Wadesville	P. R. C. and I. Co.	Rowland & Co.	11,643
Phœnix, No. 4.	Phœnix Park	P. R. C. and I. Co.	J. O. Maley.	1,392
Diamond, No. 2	Forestville	P. R. C. and I. Co.	L. Sutter & Co	2,114
Mammoth shafts.	East Mines	P. R. C. and I. Co.	P. R. C. and I. Co.	8,113
Hickory slope	St. Clair.	P. R. C. and I. Co.	Wm. Draper & Co.	18,113
Mine Hill Gap	Mine Hill Gap.	P. R. C. and I. Co.	Wm. Kendrick	225
Swift Creek.	Tuscarora	G. Bast and others,	G. Bast & Co	Idle.
Alaska.	Tamaqua	P. R. C. and I. Co.	Gen. H. L. Cake & Co	16,753
Wabash	Reevesdale	P. R. C. and I. Co.	Wm. Kendrick	26,493
Reevesdale	Reevesdale	P. R. C. and I. Co.	Wm. Kendrick	493
Newkirk	Reevesdale	P. R. C. and I. Co.	Fry & Shoemaker	26,493
Silver Creek	Silver Creek	Swayne & Able	Thos. Williams	12,968
Pine Forest	St. Clair.	P. R. C. and I. Co.	Wm. Kendrick	97,106
Hickory shaft.	Wadesville	P. R. C. and I. Co.	Wm. Kendrick	78,294
Greenwood	Tamaqua	Lehigh C. & N. Co.	E. Borda	88,122
Greenwood, No. 2	Tamaqua	Lehigh C. & N. Co.	E. Borda	
Beechwood	Mt. Laffee.	P. R. C. and I. Co.	Wm. Kendrick	89,649
York	Pottsville.	A. Russell & others	Llewellyn & Co.	400
York Farm	Pottsville	A. Russell & others	Job Rich	600
Sharp Mountain	Pottsville.	Richardson	Jos. Wood.	7,444
Tamaqua	Tamaqua	P. R. C. and I. Co.	Mackey & Co.	16,834
Yorkville	Yorkville.	Richardson	Baltaiser & Co.	600
Lambert	Combola		S. Morgan.	9,810
New Philadelp'a	N. Philadelphia.		Hein & Co.	1,048
Thomaston slope,	Thomaston	P. R. C. and I. Co.	Wm. Kendrick	3,033
Thom'n slo., new,	Thomaston	P. R. C. and I. Co.	Wm. Kendrick	15,135
Heckscherville	Heckscherville.	P. R. C. and I. Co.	J. Wadlinger	10,047
Anthracite	Tamaqua	P. R. C. and I. Co.	August Raab	268
Bull Run	Bull Run	Lehigh C. & N. Co.	L. C. and N. Co.	114,000
Taylorville	Glen Dower.	P. R. C. and I. Co.	T. Shollenberg	9,088
West Pine Knot	Coal Castle.	P. R. C. and I. Co.	Wm. Kendrick	Idle.
Little Tracy	East Mines	P. R. C. and I. Co.	C. Conner	
N. America	East Mines	P. R. C. and I. Co.	Wm. Meade.	
N. America, No. 2,	East Mines	P. R. C. and I. Co.	Faust & Bro.	
N. America, No. 3,	East Mines	P. R. C. and I. Co.	John Reese.	
Palmer	Minersville	P. R. C. and I. Co.	J. Wadlinger.	125
Tracy vein	East Mines	P. R. C. and I. Co.	Wm. Clark	250
East Mine	East Mines	P. R. C. and I. Co.	G. Seibert	250
Tuscarora	Tuscarora	P. R. C. and I. Co.	J. Sullivan	193
Kentucky	Tuscarora	Kentucky Bank	Sholl & Donohoe	13,096
Peach Orchard	Tuscarora	Kentucky Bank	R. Rowbotham	4,318
Buckville	Buckville	P. R. C. and I. Co.	Wm. Kendrick	1,755
Live Oak.	Glen Carbon.	P. R. C. and I. Co.	Wm. Kendrick	16,414

COUNTY COAL TONNAGE—*Continued.*

Names of collieries.	Locations.	Land owners.	Names of operators.	Tons coal mined.
White Oak	New Castle	P. R. C. and I. Co.	J. Dennings	440
Oak Dale	Glen Carbon	P. R. C. and I. Co.	John Lucas	48,137
Holohan	Oak Hill	P. R. C. and I. Co.	Holohan & Bro	765
Kaskawilliam	Middle Port	P. R. C. and I. Co.	J. Major	663
Palmer	Coal Hill	P. R. C. and I. Co.	B. F. Palmer	622
Taggert	New Castle	P. R. C. and I. Co.	John Taggert	173
Lanagan	New Castle	P. R. C. and I. Co.	Jas. Lanagan	249
J. R. Jones	Minersville	P. R. C. and I. Co.	J. R. Jones	364
Konfer	Minersville	P. R. C. and I. Co.	Konfer & Kantner	495
New Kerk slope	New Kerk	P. R. C. and I. Co.	Moss & Abblitt	1,765
Six others		P. R. C. and I. Co.		738
Wm. Penn	Shenandoah	P. R. C. and I. Co.	Wm. Kendrick	89,360
Indian Ridge	Shenandoah	P. R. C. and I. Co.	Wm. Kendrick	80,560
Locust Dale	Locust Dale	P. R. C. and I. Co.	S. C. Harris	29,964
East Mahanoy	Mahanoy city	Delano Land Co	Focht & Whittaker	59,606
Lehigh, No. 4	Shenandoah	P. R. C. and I. Co.	Packer & Co.	
Knickerbocker	Maple Dale	P. R. C. and I. Co.	Fowler & Co	45,596
M'Neal, 1, 2 & 3	Maple Dale	P. R. C. and I. Co.	Wm. Kendrick	1,445
Primrose	Mahanoy city	Caldwell and oth's	G. Nevills & Co	25,000
Mahanoy city	Mahanoy city	P. R. C. and I. Co.	Romel, Hill & H'rris	101,289
St. Nicholas	St. Nicholas	P. R. C. and I. Co.	J. Dennison & Co	88,149
Delano	Mahanoy city	L. V. R. R. Co.	Gorman and others	15,013
Suffolk	St. Nicholas	P. R. C. and I. Co.	Phillips & Son	49,080
Stanton	Gilberton	J. Gilbert	Miller & Maize	52,989
Lawrence	Gilberton	J. Gilbert	J. Lawrence & Co	66,825
Bear Ridge	New Plains	Philadelphia city	Mumper and oth's.	4,649
Hon'y Brook, 1, 2, 3	New Pottsville	H. Brook C. Co.	H. B. C. Company	196,956
Cambrian	Ashland	P. R. C. and I. Co.	Atkins & Co.	17,291
Plank Ridge	Shenandoah city	P. R. C. and I. Co.	Lee & Grant.	133,103
Grant	Mahanoy city	Delano Land Co	Dr. Yocum	2,513
West Lehigh	Shenandoah	P. R. C. and I. Co.	White & Co.	10,000
Preston, 1 & 2	Girardsville	P. R. C. and I. Co.	Wm. Kendrick	67,781
Boston Run	Gilberton	P. R. C. and I. Co.	Althouse & Bro.	62,000
Bear Run	St. Nicholas	P. R. C. and I. Co.	Wiggan & Trebles	74,430
Furnace	Gilberton	J. Gilbert	Atkins & Bro.	26,777
Draper	Gilberton	J. Gilbert	Wm. Draper	125,544
Girard	Girardsville	Philadelphia city	Beatty & Garretson	40,425
Kohinoor	Shenandoah city	J. Gilbert	R. Heckscher & Co.	104,743
Tunnel Ridge	Mahanoy city	P. R. C. and I. Co.	G. B. Cole	83,760
Elmwood	Mahanoy city	P. R. C. and I. Co.	Lee & Wren.	5,339
Gilbert	Gilberton	J. Gilbert	Gilberton C. Co.	65,227
Ellen Gowan	Maple Dale	P. R. C. and I. Co.	J. C. Scott & Son	76,409
Girardsville	Girardsville	Philadelphia city	Agard & Moody	84,947
M'Michæl	Girardsville	Philadelphia city	Agard & Moody	18,822
Preston, 3 & 4	Girardsville	P. R. C. and I. Co.	Wm. Kendrick	54,558
Keystone	Locust Dale	P. R. C. and I. Co.	Wm. Kendrick	24,845
Malvern	Mahanoy city	P. R. C. and I. Co.	A. Hunt	50,000
Copley	Mahanoy city	L. Val. R. R. Co.	Lentz & Bowman	50,000
Glendon	Mahanoy city	L. Val. R. R. Co.	J. B. Boylan	50,000
Locust Run	Ashland	Locust Mt. C. 1. Co	G. S. Ripplier	84,309
Lehigh, No. 3	Shenandoah city	Girard heirs	Philad'a C. Co.	53,250
Lilly	Ashland	P. R. C. and I. Co.	Wm. Kendrick	44,919
Colorado	Colorado	P. R. C. and I. Co.	Philad'a C. Co.	127,085
Shenandoah city	Shenandoah city	P. R. C. and I. Co.	J. O. Rhoades	74,061
Beaver Run	Mahanoy city	Delano Land Co	Peter Bowman	2,026
Excelsior	Ashland	P. R. C. and I. Co.	J. R. Cleaver	9,234
Thomas	Shenandoah city	Girard heirs	Thomas Coal Co.	106,279
Hill Side	Mahanoy city	P. R. C. and I. Co.	G. Pomroy	8,349
Turkey Run	Shenandoah city	Gilbert & Sheafer	Breneizer & Co	77,469
Girard Mammoth	Raven Run	Girard heirs	J. Donaldson	39,996
Lost Creek	Lost Creek	Philadelphia city	Philad'a C. Co.	63,459
Tunnel	Ashland	P. R. C. and I. Co.	J. K. Seigfreid	1,475
Cuyler	Raven Run	Girard heirs	Heaton & Bro.	41,617
Hartford	Mahanoy city	Kear & Patterson	H. Eshelman	36,498
West Shenando'h	Shenandoah city	Gilbert & Sheafer	Maize & Lewis	9,487
Big Mine Run	Ashland	P. R. C. and I. Co.	Taylor & Lindsay	11,742
Burget	Ashland	P. R. C. and I. Co.	J. D. Gilmore	331

County Coal Tonnage—*Continued.*

Names of collieries.	Location.	Land owners.	Names of operators.	Tons coal mined.
Oliver	Shenandoah City	P. & R. C. & I. Co.	Jones Ward & Oliv'r	5,252
Silliman	Mahanoy City	Phila. & M. C. Co.	Rom'l, Hill & Harris	5,722
B. L. Eschelman,	Mahanoy City	Delano L. Co	B. L. Eschelman	5,712
Brookside	Brookside	Monson & Williams	Gordon & Repplier,	50,891
Black Diamond	Locust Summit	Lykens S. C. Co	Schmoely & Co	1,654
Colkett	Donaldson	Tremont C. Co	Ow'n, Eck'l & Colk't	63,487
Diamond	Forestville	P. & R. C. & I. Co.	J. Wadlinger	33,972
Franklin	Strongville	P. & R. C. & I. Co.	Wm. Kendrick	73,896
Kalmea	Paul valley	Fish'g creek estate	Phillips & Sheafer,	22,022
L. Rauch Creek	Rauch creek	Swatara C. Co.	Miller and Graff	117,713
Lincoln	Lorberry	Swatara C. Co.	Levi, Miller & Co.,	40,592
Middle Creek	Middle creek	Tremont C. Co.	P. & R. C. & I. Co.	*
Otto's, 1, 2 and 3	Branch Dale.	P. & R. C. & I. Co.	Wm. Kendrick	71,325
Phœnix, No. 2	Phœnix Park	P. & R. C. & I. Co.	Wm. Kendrick	19,601
Phœnix, No. 3	Phœnix Park	P. & R. C. & I. Co.	Wm. Kendrick	829
Swatara	Swatara	Manhattan C. Co.	Claud White	8,504
Straw	Swatara	Helfenstein & Bro.	Winlack & others	577
Tower city	Tower City	Monson & Williams	Gordon & Repplier,	32,696
Tremont	Tremont	Tremont C. Co	All'n, Fish'r & oth'rs	3,249
West end	Donaldson	Tremont C. Co	Ow'n, Eck'l & Colk't	561
White	Donaldson	Tremont C. Co	J. C. White	299
			Miscellaneous	1,318
Schuylkill county shipments				4,130,593
Local consumption				1,181,000
Screenings and land sales				
				5,311,593

One death to each 78,981 tons mined.

Northumberland County.

Names of collieries.	Location.	Land owners.	Names of operators.	Tons coal mined.
A. S. Wolff	Locust Gap	L. Gap I. & C. Co.,	Kemble & Græber,	50,982
Big Mountain	Shamokin	B. Mt. Im't Co	J. Langdon & Co	67,924
Buck Ridge	Shamokin	L. Gap I. & C. Co.,	May and others	89,384
Burnside	Shamokin	B. Mt. Im't Co	May & Co	66,109
Bear Valley	Carbon run	C. Run Im't Co	Goodwill & Co	61,721
Brady	Shamokin	Fulton C. Co	Guit'rm'n & Gorm'n	620
Luke Fidler	Shamokin	Burnside C. Co	M. R. C. & M. Co.,	76,812
Cameron	Trevorton	P. & R. C. & I. Co.	Wm. Kindrick	76,510
Stuartville	Mt. Carmel	Mt. C. C. & I. Co.,	Wm. Montilius	91,560
Hickory Swamp	Shamokin	N. C. R. R. Co [Co.	M. R. R. & M. Co.	49,236
Reliance	Shamokin	M. C. & L. M. C. & I.	Bomgardner & Co.,	65,794
Henry Clay	Shamokin	Fulton C. Co	Guit'rm'n & Gorm'n	64,220
Trevorton	Trevorton	P. R. & L. V. R. Co.,	N. Franklin C. Co.,	59,284
Monitor	Locust Gap	L. G. Im't Co	G. W. John & Bro.	58,185
Locust Gap	Locust Gap	L. G. Im't Co	Kimble & Græber.	54,883
Excelsior	Shamokin	Fulton C. Co	Ex. Min. Co.	51,617
Coal Ridge	Mt. Carmel	C. R. C. & I. Co.	Burton and others.	50,698
Ben Franklin	Helfenstein	Helfenstein & Bro.,	R. B. Douty.	27,743
Greenback	Shamokin	Fulton C. Co	Guit'rm'n & Gorm'n	25,537
Hickory Ridge	Shamokin	N. C. R. R. Co	J. Langdon & Co	22,882
Enterprise	Shamokin	Ent. C. Co	Ent. C. Co.	23,600
Shamokin	Shamokin	Hay, Kelso & Keller	Weaver & Martin	22,804
Helfenstein	Helfenstein	Helfenstein Bros.	Fagely & Co	21,845
Coal Mountain	Stuartville	S. & C. M. C. Co.	Rhoades & others	14,951
Daniel Webster	Shamokin	North'd L. Ass.	Wm. Brown	14,843
Lambert	Shamokin	Shamokin C. Co	Wm. Brown	13,627
Morton	Shamokin		A. Morton	12,897

*Sinking shaft.

County Coal Tonnage—*Continued.*

Names of collieries.	Locations.	Land owners.	Names of operators.	Tons coal mined.
Caledonia	Shamokin.	Henry Saylor	Schwanck & Co.	8,177
Franklin	Helfenstein.	Helfenstein Bros.	Haas & others.	7,135
Frank Gowen	Shamokin.	Bell's heirs	Shipp & Co.	5,920
Marshall	Shamokin.	North'd Land Ass.	Helm & Co	5,207
George Fales	Shamokin.	Fulton Coal Co.	Reese & Bros	6,097
Lancaster	Shamokin.	N. C. R. R. Co.	Smith & Kiser	2,141
Locust Summit	Shamokin.	L. S. C. Co.	Carter & Gorman	863
Margie Franklin	Shamokin.	Fulton Coal Co.	Enterprise C. Co.	85
			Miscellaneous	18
Marians	Locust Gap	P. R. C. and I. Co.	Locust Dale C. Co.	14,883
Franklin	Helfenstein.	Helfenstein Bros.	Gordon & Smith	24,122
Aggregate shipments				1,221,327
Local consumption				170,000
Screenings and land sales				
Aggregate number of tons mined				1,391,327

One death to each 138,132 tons mined.

COLUMBIA COUNTY SHIPMENTS IN 1872.

Names of collieries.	Locations.	Land owners.	Names of operators.	Tons coal mined.
Union	Centralia	Girard heirs	Ryon & Anderson	47,394
Continental	Centralia	Philadelphia city	R. Gorrell, agent	93,139
Hazle Dell	Centralia	L. Mt. C. and I. Co.	Robert Gorrell	63,889
Eagle	Centralia	Girard heirs	Philip Brinzle	6,059
Centralia	Centralia	L. Mt. C. and I. Co.	J. M. Freck	69
Locust Dale	Locust Dale	P. R. C. and I. Co.	S. C. Harris, ag't	29,964
Locust Run	Centralia	L. Mt. C. and I. Co.	G. S. Repplier	84,309
Seven collieries shipped				334,823
Local consumption				10,000
Screenings and land sales				400
Aggregate tons of coal mined				344,223

One death to each 49,174 tons mined.

DAUPHIN COUNTY SHIPMENTS IN 1872.

Names of collieries.	Locations.	Land owners.	Names of operators.	Tons coal mined.
Williamstown	Williamstown	Lykens Sum. C. Co.	Lykens Sum. C. Co.	
Short Mountain	Williamstown	Lykens Sum. C. Co.	Lykens Sum. C. Co.	
Big Lick	Williamstown	Lykens Sum. C. Co.	Lykens Sum. C. Co.	
East Franklin	Williamstown	Lykens Sum. C. Co.	Lykens Sum. C. Co.	
Total shipments				450,328
Local consumption				40,000
Screenings and land sales				
Aggregate tons of coal mined				490,328

One death to each 61,290 tons mined.

It will be observed that in the district of Schuylkill there are 30,500 persons employed in mining and handling coal, and that the coal tonnage of the year reaches to 7,537,468 tons, while not more than 14,500 of the whole force of the district are employed in mining, which would average 519 tons each, while not more than one-fourth of the persons employed in British mines are employed out-

side. The product of the mines of Great Britain is nearly all utilized, whilst fully one-half of the product of our anthracite mines is put to waste, the handling of which is a serious expenditure, besides its great inconvenience in crowding up the buildings necessarily used at the colliery, which often necessitates the removal of these large structures to a more favorable locality at an enormous cost to the operator.

Attempts have been made by a few individuals to manufacture an article for fuel out of this waste, but so far their efforts have not proved a pecuniary success. Although the specimens which we examined under experiment gave evidence of satisfactory results, the introduction of this new sort of fuel received no encouragement to warrant an outlay by the parties, and therefore, this subject is set aside for the present.

I have no doubt but this enormous waste will yet be utilized, but the necessity does not now exist to require its use, whilst the present article of fuel is so readily procured. Although we are always opposed to the general manner of preparing coal since the introduction of the *Battin roller* system, which destroys a large percentage of our best coal, but such is the desire of the operators for their use, owing to their capacity for rapid production, that the great loss they create is overlooked in the great anxiety to accomplish a large amount of labor in a short period of time to fill up consignments, at a given notice from abroad.

COAL—ANTHRACITE.

The geological conformation of the soil of Pennsylvania, embracing the general terms of original rock structure and decomposed superficial complex form of the diversified quality and system. The Lawrentian system—the oldest series—appears in the South Mountain and the Welsh Mountains. The Huronian system ranges next in order and age, but is not exposed in the State. But the Palæozoic or older secondary system: First, the Potsdam sandstone, seen at Reading and along the North Valley Hill, in Chester county, and terminating near the coal measures, is also finely developed throughout the State. The Mesozoic or middle secondary system, New Red Sandstone, Trias, &c., is thinly diffused over the last, in a zone of country embracing the counties of Berks, Bucks, Lebanon, Lancaster, York and Adams. The Kainozoic or Tertiary system or Cretaceous system is only found outside the limits of the State and forms the Atlantic seaboard. The valley of the Delaware has been deeply filled with Animal Post-pliocenеage. But the Beaver and other rivers occupying the drift terraces in the north-western section of the State are assigned to the Quaternian or Human age, or the age when man originally occupied the earth. These Quaternian and Tertiary terms are purely conditional, while those between the Tertiary and Cretaceous, or Cretaceous and Jurassic, or Trias and Permian, or between any two systems are used as conventional terms, in the order of classification more than of truth. Gaps that are open in mountain ranges to separate formations in one county are found to be filled with by intermediate deposits in another county, and geologists customarily designate the age by the animal formation peculiar to the rocky structure. There are three notable features in the geology of Pennsylvania which strongly resemble land and sea levels, as shown by chemical action into gneiss, granite, slates, marble, rolled conglomerate, sandstone, mud rocks and limestone, all of which bear the visible marks of pressure, moisture and heat.

The base floor of the State, like that of the United States throughout, is principally formed of granite, gneiss, mica, slate and marble, in stratas of various depths. Beneath the anthracite coal floor and the Broad Top, the stupendous depth of seven miles might be sunk before the rock formation of Labrador and Canada, the central ridges of Utah, the hills of Missouri and Arkansas, those of North Carolina, Massachusetts and Maine—these rocks are characterized by specular iron ore, feldspar and minerals containing iron, and may continue down to inaccessible depths, from the stupendous causes that acted upon the surface of the country in ancient ages, by decomposition. Hydrostatic pressure denuded the elevated formations of the deposits stored away within them and washed the debris out into the margin of the great waters, creating a new surface, such as may be seen along our Atlantic fringed shores.

The next oldest rocks are those found at Philadelphia, Chester, Delaware, Lancaster, York and Adams counties, and are formed of stratas of gneiss, with mica slate, containing white magnesia, limestone, serpentine, trap, iron ore and quartz veins containing gold, chromic and titanic acid, and continues into Georgia. Some of the decomposed Codorus ore-beds afford extensive beds of brown hematite in York and Adams counties, and in time will become as notable as the Lehigh

river district. Geologists have separated the Pennsylvania Palæozoic system into thirteen formations: *i. e.*, six species of sand rock, four slate and shale and two of limestone; and these thirteen embrace the coal measures—that all the mountains of the State are outcrops except the South Mountain range. The Potsdam white sandstone underlie the Palæozoic formation; the limestone contains brown hematite iron ore, lead, zinc and barytes; the shale contains roof-slates at Lehigh; the sandstone forms the Kittatinny, north, Bower's Cove, (in Fulton county,) Tuscarora, Black Log, Shade, Stone, Jack, Buffalo, in Union county. Nitany, Muncy, Bald Eagle, Dennings, Lock Canoe Hole, Tussy, Evitts, Wild Mountains and Montour Ridge, red shales with fossil ore beds, the limestone with brown hematite iron ore pockets and lead; the sandstone usually forming a rocky ridge, but in Juniata and Perry counties rise to considerable mountain ranges; the olive shales and green sandstone with hydraulic limestone rocks, and occasional thin coal seams with valuable brown hematite, whilst in the western districts are found large saltwater basins and petroleum. The red sandstone forms terraces on the white sandstone, as the Catskill, Pocona, Second Mountain, Cove Mountain, (in Dauphin county,) Short, Berry's, Buffalo, (in Perry county,) Mahantongo, Mahanoy, Catawissa, Nescopec, Wyoming, Shickshinny, Shawnee, Allegheny, Elk, Towanda, Blossburg, Town Hill, Scrub Ridge Mountains. The conglomerate or white sandstone supports the coal measures and forms the Mauch Chunk, Locust, Short, Sharp, Big. Broad, Mahanoy, Beaver Meadow, Sugar Loaf, Buck, Hell Gate and the MacCauley Mountains, (in Schuylkill, Carbon and Luzerne counties;) the Broad Top, Mount Savage, Little Allegheny, in the southern district of the State. A subordinate system of mountains constitutes the coal measures, which requires a description peculiar to their formation.

Prof. H. D. Rogers has in his Geological Report of Pennsylvania, substituted divisions of the day in place of numericals, to designate the local names of the different formations or geological systems, as appears in the subjoined table, assigned to Pennsylvania formations as the outcrop with diminished thickness in long belts running east and west, and the same system appears in the State of New York

GEOLOGICAL NOMENCLATURE IN NEW YORK AND PENNSYLVANIA.

Thickness in feet in Penn'a.	H. D. Roger's Nomenclature.			English and New York Nomenclature.	*Thickness in New York.*
3000 feet	Coal Measures.	13		Eroded from New York.	
1200 "	Seral Conglomerate.	12	Carboniferous System.	Eroded from New York.	
3000 "	Umbrel red sandstone.	11			
2500 "	Vespertine sandstone.	10		Catskill group.	2500 feet.
600 "	Ponent red sandstone.	9			
3200 "	Vergent olive shale.	8	Old red lime grit.	Chemung group.	1500 "
1700 "	Vergent gray sandstone.			Portage group.	1200 "
700 "	Cadent upper black slate.			Genesee slates.	
1100 "	Cadent olive shales.			Hamilton slates.	1200 "
800 "	Cadent lower black shales.			Marcellus shales.	
300 "	Post meridian limestone.			Upper Heidelb'g limestone	
	Wanting in Pennsylvania.		Devonian.	Schoharie grit.	400 "
	" "			Chandagæll grit.	
500 "	Meridian Sandstone.	7		Oriskany sandstone.	50 "
600 "	Premeridian limestone.	6	Upper Silurian.	Lower Helderb'g limestone.	200 "
350 "	Scalent limestone.				
	Wanting in Pennsylvania.				
	" "			Onandago salt group.	1000 "
				Niagara limestone.	250 "
2600 "	Surgent red shales.	5		Clinton Group.	200 "
"	Levant white sandstone.	4		Medina sandstone.	400 "
1800 "	Levant red sandstone.			Shawnyunk grit.	500 "
"	Levant gray sandstone.			Oneida conglomerate.	100 "
1200 "	Matinal blue slates.	3	Lower Silurian, Trenton.	Hudson slates.	1000 "
400 "	Matinal black slates.			Utica slates.	
550 "	Matinal limestone.			Black river limestone.	
5500 "	Auroral Magnesia limestone.	2		Bird's eye do.	300 "
250 "	Auroral calc sand.			Chazey do.	
4000 "	Primal sandstone.	1		Calciferous sand rock.	
	Primal slate.			Potsdam sandstone.	50 "

It will be understood that the stratas above differ considerably in different localities southward and northward. In Pennsylvania the sum of these depths amount to 32,850 feet, while in New York only 10,850 feet. The conglomerate at

Pottsville is 1,200 feet thick, while scarcely 300 feet thick at the Wyoming mountain, and gradually thins out to 100 feet thick at Towanda and Blossburg. The thickness of the silicious formation degenerates northwardly in like manner. At Pottsville are pudding stone, conglomerate and course sand rocks. Along the Allegheny escarpments the conglomerate pebbles are small, while at Lock Haven they appear very large. Throughout the territory bordering on the Ohio State line the rocks are reduced to a coarse pliable sandstone, destitute of any pebbles. The conglomerate of the anthracite measures obey the same law, and become reduced to a mere coarse sandstone in the bituminous regions. The Palæozoic system can scarcely be successfully defined in the Sinnemahoning, Genesee and Allegheny counties. In the oil bearing rocks there is scarcely any noticeable distinction between the conglomerate and surgent system. In the Southern States there are coal seams found in and under the red shale of the Levant system.

The coal measures characteristically described contain zinc, lead, barytes, lime, magnesia and iron; the zinc, lead and barytes are confined to the limestone formation; sulphuret and silicate of zinc, with oxide of magnesia are found in the brown hematite through the Cumberland valley, &c. Many of those veins are of vast thickness: *e. g.*, the Bloomsburg bed at Morrisons's cove is 100 feet thick; the Mount Pleasant, at Path valley, is 80 feet thick; the Moselem bed is of unknown thickness. The whole phenomenon is local, dependent upon the solubility of the limestone system, possessing vast quantities of iron ore. Baker's bed at Altoona, is of vast proportions. At Ralston, Elmira and Williamsport extensive beds of blue carbonate of iron is worked. It is largely stratified through Somerset, Fayette, Centre, Lycoming, M'Kean, Butler and Lawrence counties, and also in Warren.

The coal measures or carboniferous formation is divided in two series of lower and upper, by some 500 feet of barren measures, in Washington and Greene counties and the central hills of the Pottsville anthracite basin. The total thickness of the carboniferous strata is unknown, and it is equally uncertain whether or not if the Permian formation had ever been deposited upon them. What is now remaining will measure 3,000 feet. The bituminous and semi-bituminous beds are the same at Cumberland, Broad Top, Blossburg and Towanda, and are the same beds as the anthracite beds in Luzerne, Carbon, Schuylkill, Columbia, Northumberland and Dauphin. The character of the different coal may be traced to the facility of the escape of the volatile hydrocarbonous form of the coal beds by the disturbed condition of the stratas. Where the gas is pent up the coal retains its bitumen quality; this being the case it renders it very remarkable.

Near Mauch Chunk the coal contains from 2 to 5 per cent. of gas; at Pottstown from 7 to 10 per cent.; Lykens Valley, Shamokin and Trevorton from 10 to 12 per cent.; on Broad Top from 15 to 17 per cent.; at Altoona 20 per cent.; at Mount Pleasant and Clearfield 22 to 25 per cent.; and further west, from 30 to 40 per cent. In the anthracite regions many of the coal seams stand nearly vertical and often the texture of the coal appears to be crushed. In the Allegheny and Monongahela districts the coal seams are found in a horizontal position, while in the anthracite regions the seams are found jammed, broken, contorted, overlapped, swelled, thinned, &c., forming numerous basins pointing east and west.

Five great changes subdivide western Pennsylvania into six great shallow bituminous basins, getting shallower as they extend westward, terminating in broad expanse of horizontal coal seams to the Ohio and Virginia State lines. Another striking difference between the anthracite and bituminous coal seams respecting their thickness, is in the Pittsburg beds. They grow gradually thicker as they ascend the Monongahela river, and are twelve feet thick at Connellsville, while westward they are but six feet thick. At Somerset county the seam is fourteen feet thick in a small fragment, and sixteen feet in the Cumberland basin. In Clearfield and Jefferson counties the lower coal bed is twelve feet thick. On the Allegheny mountain, Bell's, eight feet of a coal seam is worked; but the anthracite seams reach from four feet of good, workable coal to sixty feet, and upwards.

Out of all the known coal seams in the bituminous regions only twelve can be selected, and six of these belong to the lower series. In the anthracite region there are fifteen enumerated.

The position of the bituminous coal seams in the formation is shown in the following scheme:

Upper coal series.	Shales in the upper strata	80 feet.
	Coarse sandstone	35 "
	Shales	10 "
	Coal L—Brownsville coal	6 "
	Shales	60 "
	Massive sandstone	35 "
	Coal K	3 "
	Limestone	8 "
	Shales	50 "
	Sandstone	15 "
	Coal J	2 "
	Shales	10 "
	Limestone	60 "
	Coal I—limestone coal	2 "
	Non-fosiliferous limestone	15 "
	Massive sandstone	25 "
	Shale	20 "
	Shale and ore	30 "
	Coal H—Pittsburg bed, 6 to 12 feet	12 "
Barren measures.	Limestone, ore and shales	25 "
	Shales and sandstone	30 "
	Limestone	4 "
	Red shales	12 "
	Limestone	4 "
	Yellow shale	10 "
	Buff shale	18 "
	Red shale	4 "
	Limestone	3 "
	Shale and sand	10 "
	Red marl	10 "
	Gray sandstone	70 "
	Olive shale	100 "
	Limestone	2 "
	Coal G	1 "
	Red and blue marls	20 "
	Slaty sandstone	30 "
	Shales	50 "
	Coal F—Elk Lick	1 "
	Mahoning sandstone	75 "
Lower coal series.	Shales	50 "
	Coal E—Upper Freeport	6 "
	Limestone	8 "
	Shales	50 "
	Coal D—Lower Freeport	3 "
	Sandstone, with thin coal	70 "
	Shales and thin coals	100 "
	Coal C—Kittanning	3 "
	Shales	25 "
	Buhrstone ore	—
	Limestone	25 "
	Shales	30 "
	Coal B—Ferriferous	3½ "
	Shales and coal beds	40 "
	Conglomerate and coal A	100 "

In the anthracite regions the beds of the foregoing section are exhibited under a different aspect. The intervals vary at every mine; also the character and condition of each coal seam. A section at Scranton will exhibit the appearance of the series in that region.

Series.	Feet.	Series.	Feet.
Shales	25	Intervals of sandstone	40
Coal I	5	Coal D	8
Shales	20	Inte'ls of sandstone and top slate,	60
Coal H	7	Coal C	6
Interval of sandstone and shales	90	Intervals of sandstone	50
Coal G	12	Coal B	5
Intervals of sandstone and shales	80	Sandstone and slate	50
Coal F	6	Coal A	2
Intervals of sandstone chiefly	50	Sandstone and slates	50
Coal E	15	Conglomerate floor	

A section of the measures at Pottsville, as they appear in the section series of that region:

Series.	Feet.	Series.	Feet.
Shales covering coal		Intervals of sandstone and shales	175
Coal N. Sandrock Red Ash	3	Coal F. Holmes seam	4
Intervals of sandstone and shales,	130	Intervals sandstone and shales	100
Coal M. Gate seam, R. A	9	Coal. Seven and four feet seams,	
Interval of sandrock and shales	150	with parting slate	11
Coal L. Little Tracy, B. A	4	Sandstone and shales	20
Interval of sandstone and shales	72	Coal E. Mammoth White Ash	35
Coal K. Big Tracy, R. A	9		75
Intervals of sandstone and shales,	192	Coal F. Skidmore seam, W. A	8
Coal J. Diamond, R. A	7		100
Intervals of sandstone and shales,	270	Coal C. Gamma	5
Coal I. Little Orchard	3		125
Intervals of sandstone and shales,	50	Coal B. Buck Mountain	10
Coal H. Big Orchard	6		50
Intervals of sandstone and shales,	100	Coal A. Alpha	3
Coal G. Primrose	10	Conglomerate floor	

There are about ten workable coal seams in this basin, and their local and classical nomenclature are given in the foregoing section, as given in a work on Coal, Iron and Oil, by Bannan & Daddow.

No amount of air can prevent blowers, as regards their liability to explode, except the constant use of the safety lamps in such working places. To the safety lamp alone, then, we must look for safety.

Any colliery having an active, honest, intelligent superintendent to manage affairs will seldom have any accidents, except such accidents as may occur by the acts of careless or ignorant workmen, of which there are many such persons.

The following diagram is illustrative of the combustion of fire-damp, of which the product is after-damp or choke-damp:

Fire-damp before combustion.	Elementary mixtures after combustion.		Products of combustion.
Weight.	*Atoms.*	*Weight.*	*Weight.*
8 carburetted hydrogen	1 carbon	6	22 carbonic acid
	1 hydrogen	1	9 steam.
	1 hydrogen	1	9 steam.
144 atmospheric air	1 oxygen	8	
	1 ...do	8	
	1 ...do	8	
	1 ...do	8	[combined.
	8 nitrogen	112	112 nitrogen un-
152		152	152 after-damp.

This melancholy fact forcibly attracts attention to the inquiry: To what proportion of these accidents preventable causes may be due, and how far from them are the dangerous nature of the miners' occupation inseparable? In most cases mine accidents scarcely receive a passing notice, except in the vicinity of a serious disaster, where, for a time, all is inquisitive confusion, often enveloped in paliative excuses and speculative opinions, as the result of accident or irresponsible causes among the thousands of workingmen, as well as higher agencies, until of late.

Since the State commission of mine inspectors, these various causes have been carefully investigated, and have been fully recorded, and valuable information afforded by their published reports, especially of the chief accidents which have taken place in each year. By this means casualties that are deemed accidents, that occur from unforseen causes, are set plainly before us, that a diligent study of their description ought to effect a diminution of their occurrence from year to year. Often it has been objected to the inspectors that the number of casualties is not diminished in a greater degree, but it should be remembered that whilst the casualties really are diminished, the production of coal has been increased, and in like ratio has the number of workingmen been increased, as will be shown by our statistics of deaths and injuries. The result of the system of mine inspection cannot but be considered a success.

It will be seen by a careful perusal of our statistics that in each year there arises accidents from infraction of the laws and of the rules prescribed by the inspectors, being generally applicable to the safety of men. The variety and condition of the collieries are more or less subject to frequent and different kinds of accidents, in accordance with the nature of the coal seam, the character of the top rock and age of the mine, the length of time the colliery has been in operation, the plan upon which it is worked, the general intelligence of the managers and workingmen, the proper government of the employees and enforcement of good order amongst the workmen, for whilst at one colliery one death or accident will average for 90,000 tons produced, another more favored colliery may have scarcely any accident to 150,000 tons mined.

The following tables, taken from official records, will show the number of deaths and casualties, resulting from different causes, in the several collieries of this district, from the commencement of the establishment by the State government of inspectors of coal mines, with the gratifying fact that great disasters are rapidly decreasing, that a better system of ventilation has been adopted, rendering great explosions less frequent than has been the case in former years, with less force of workingmen, and a smaller production of coal.

Falls of roof are amongst the most prolific sources of accidents, and are principally occasioned by soft shaley top rock where the excavations are carried on on a large scale, with a lack of proper timbering, and detached masses of shale give way to pressure. To guard against this class of accidents, it is necessary to limit the excavations, or resort to a proper system of timbering and gobbing. If the miner is not a practical person, competent to do this work, it should then be performed by practical parties. Contractors are apt to neglect the necessary precautions, intent upon making the most money by the smallest amount of labor, and often, when the roof is treacherous in appearance, this neglect is permitted even by the contractors and some bosses, by confiding blindly to the character of the roof, while a few well set props would counteract an overwhelming crush, and save both life and property.

Fire-damp explosions.—The form and extent of the excavations, the abundance of gas, and negligence, are the sources of terrible casualties. Effective ventilation and proper precaution, if promptly applied, will remedy this great evil. The explosion may be quite harmless, or may not involve more than one unfortunate individual, or may take place in a single locality, giving no serious alarm to the workingmen, whilst in neglected districts it may flash with lightning fury, carrying all within its limits to destruction, not leaving one person alive in its track, and enveloping every object in ruin. Some coal evolves much more gas than others, while there are certain coal seams that generate scarcely any gas at all. In a good current of air in mines that generate fire-damp abundantly men should not experiment with naked lights, for woe to him who will voluntarily and yet carelessly enter an unexplored nook, in which a portion of gas is in an explosive condition; his incautiousness will most assuredly bring him to grief. But of late a vast amount of relief is found in the use of the safety lamp, in connection

with instruments used in mines to ascertain the condition, pressure, temperature and velocity of the air, and of the quantum of air supplied by its system of ventilation. First, in the order of their usefulness, is the safety lamp; next is the anemometer, or air fan; next is the use of the thermometer, to ascertain the temperature; next the barometer, to ascertain the atmospheric pressure or weight of the mine air and gaseous air; next the water gauge, which will afford a knowledge of the pressure of the circulating volume of air supplied.

STEAM JET VENTILATION.

The steam jet system of ventilation in mines is known to have been used as early as 1814, but owing to its not being practically put to use it became a failure at the time. In the year 1828 a Mr. Stewart, of Wales, used it as a ventilator, but then, as before, its use had been abandoned. Again, in 1835, a Mr. Goldsworthy Gurney explained his views on the subject of steam jet ventilation; and again, in 1839, he made an elaborate communication to the parliamentary committee for inquiry into mine accidents, upon its practical use, but nothing appears to favor its practical use; but Mr. T. E. Forster, at Seaton Delaval colliery, in 1848, put his system into practical use, and the subject received such commendable opinions, by practical as well as scientific persons, that parliamentary committees considered it superior, for ventilation of coal mines, to furnace ventilation. At length the subject received the closest scrutiny by colliery viewers, and both powers being tested by the most careful experiments, it was proved that furnace ventilation, of the two, is the most serviceable, and that the steam jet is attended with an increased expenditure in fuel, not taking into consideration the machinery and its attachments, without any corresponding advantage, either in the steadiness, security or efficiency of ventilation; that the furnace is less liable to derangement of its efficiency in cases of emergency, and is a more secure, more safe and more eligible mode of ventilation than the steam jet, the latter increased consumption of coal being nearly three to one.

MECHANICAL VENTILATION.

There are several systems of machine ventilators in use. Some are used for forcing air into the mines, whilst others again are used to exhaust the air out of the mines. There is a considerable saving of fuel in the operation of the steam fan system of ventilation, and a large amount of effective power obtained which none of the other systems can supply. In Belgium coal mines that produce fire-damp the furnace system is prohibited by law and steam fan system substituted, for safe, effective power and economy. In addition to the above, the pump and piston system had been in use. A large machine had been erected by a Mr. Nixon, near Aberdare; the Elscar fan, by Mr. Biram; the centrifugal ventilator, of Mr. Brunton; the pneumatic screw, of Mr. Motte; the windmill ventilator, of M. Lesoinne; the spiral machine, of M. Pasquet; the inclined vane fan, of M. Letoret; the curved vane fan, by M. Combes; the pneumatic wheels, of M. Fabry; the centrifugal fan, of M. Guibal, of Belgium, which is upon the principle of the exhaust fan—same as the present Beadle fan. The fan is constructed of eight arms and eight vanes of inch boards, or sheet iron secured to a revolving shaft, the whole encased, except about the one-fifth of its periphery; an outer walling for partition air-way, whereby the up-cast air is conducted to the side draw-holes of the fan; all other openings excluded. As the machinery is put in motion the vanes, in communicating a velocity, form a draft or vacuum, and instantly a current of air is created in the mine, equal to the speed of these vanes and the diameter. The following table is an extract from results of experiments taken by M. Cochrane, at Elswick colliery:

No. of experiments	Strokes of engine and fan per minute	Posit'n of shutter	Horse power applied	Horse power transmit'd to fan	Cubic ft. of air per minute	Water gauge top of pit per minute	Useful effect in horse power	Per ct. of useful effect of power applied	Useful power transmit'd to fan
1	20	1	2.39	1.99	24.123	.200	.76	29.34	83.2
2	38	1	9.94	8.37	38.487	.600	3.54	36.62	43.5
3	38	¾	10.02	8.81	39.883	.500	3.43	34.43	39.1
4	39	½	9.73	7.80	36.504	.500	2.88	29.63	37.0
5	39	¼	8.21	6.85	29.641	.250	1.17	14.26	17.1
6	41	.....	7.63	6.00	23.469	.100	.37	4.85	6.2
7	55	1	23.84	20.94	56.378	1.200	10.66	44.71	50.9
8	55	.....	.....	.....	56.995	.....	.....	.....	.....
9	57½	1	23.53	19.73	60.441	1.400	13.33	52.40	67.55
10	87	1	69.96	58.16	85.544	2.550	34.37	49.13	59.10

In testing the relative proportions of useful product of different ventilators, it is necessary to recollect that the water gauge at the top of the upcast shaft, connected with a fan or pump near to it, indicates the difference of barometrical pressure between the outer atmosphere and the air within the circuit of ventilation, (except under unusual conditions;) without any perceptible error we may consider water to weigh 62.5 lbs. per cubit foot, so that each inch of water column or gauge represents $\frac{62.5}{12} = 5.2$ lbs. per square foot of ventilating pressure; and to ascertain the power developed, we have only to multiply in such cases the difference in inches of the level of water as indicated by the water gauge, by 5.2 to find the pounds pressure per square foot; and this multiplied by the number of cubit feet of air circulating per minute, gives the foot pounds of developed power per minute, and this product divided by 33,000, gives the horse power utilized.

When the quantity of air is measured, and the water gauge is read off, and an indication of the engine taken, we have the necessary data for determining the proportion or per centage of the engine power that really utilized. With the water gauge underground the case is not the same, the reading of the instrument in such cases, not including the indication of the resistance that the air meets in the shaft, and the consumption of coal per horse power per hour.

The sudden stoppage of the fan ceases ventilation, whilst after the stoppage of a furnace the ventilation continues for a considerable time owing to the heated surroundings, and this circumstance alone is favorable to furnace ventilation.

ACCIDENTS IN MINES.

The chief causes of accidents in mines, arises from discharges of fire-damp, explosions, inundations, fall of roof and coal; other accidents arise from breaking of ropes and chains, derangement of machinery, inattention to haulage, etc. Causes of explosions in consequence of bad ventilation: the air may be loaded with fire-damp to the firing point; in which case you will have a thorough explosion. A blower may admit of good enough ventilation for a while, but will rapidly rise to the firing point when few persons may have the slightest notice of its presence; neglected doors and stoppages, will permit the accumulation of gas in districts, which will probably result in explosions. The rotten condition or injury to the lamp gauze will cause an explosion when gas is present. A good ventilation, but mismanaged so as to force the air current to be from the pillar or lamp district, into these worked with the naked lights, may produce fatal results.

The question is how can these causes be controlled, and if so, to what extent. Although under ordinary care there is no excuse for accidents from deficiency of air, because the question is well settled and proof well established that a sufficient quantum of air can be produced by a fan or furnace, to dilute and render harmless any noxious element generated in any mine if properly applied, and what is of the highest importance, spacious air-ways and well arranged stop gates. Notwithstanding the large amount of air found circulating in some of our collieries, a large addition can be made to the column by this method. Shaft, slope and drift intakes, leaves no possible excuse for want of a proper supply of air; it is the outlet air current that requires the management, all things else correspondingly

large, sufficient for the requirements of the colliery. The quantum necessary for each district, can be obtained in splits from the main current to ventilate any working district safely, and requires but skillful attention on part of the mine manager.

SAFETY LAMPS.

First.—The Davy lamp is generally the commonest lamp in use, and the most reliable, it being the most sensitive of the many safety lamps now in use. It consists of a cylindrical brass oil stock and tube, affixed to which is a wire picker, which, by moving the picker upward or downward, operates the wick at pleasure. Upon this oil cylinder is screwed a cylindrical wire gauze some 6½ inches long, by 1½ inches in diameter. Upon this tube is surmounted a bonnet of the same material, which may be removed at pleasure. This bonnet is two inches long, and envelopes the gauge tube; all of which is firmly held together by brass rods screwed on the oil stock. The standard which was fixed on for a safe limit, was a gauze with 28 iron wires to the linear inch, or 784 square meshes to the square inch, which is pronounced to be safe in careful hands. It must not, however, be exposed to rapid currents of air, or permitted to become red hot from the combustion of the gas within the gauze, otherwise it is safe; the only objection to it is the small amount of light it supplies. The lamp may be securely locked, but often miners commit very serious errors in opening it, which commonly leads to explosions. It would occupy too much space in this place to describe the various other contrivances in use as lamps, some of which are the inventions of Dr. Pereira, Clanny's lamp, Dubrielle lamp, Stephenson's lamp, Baty's lamp, Mueseler lamp and Elvin's lamp. All of which are more or less recommended by their patrons. There is no department of mining that needs a more stringent discipline than this. Impunity, ignorance and hardihood has often been the cause of sacrificing hundreds of lives. Infractions of the law, and innovations on the rules of inspectors of mines, the reckless man will jeopardize the lives of many, as well as his own, to gratify his desire for the sweets of his pipe.

THE ANEMOMITER OR AIR METER—THE BIRAM AND CASELLA INSTRUMENTS.

Second.—This instrument is used in mines, by the managers and inspectors, to ascertain the velocity of the current of air supplied by the system of ventilation used, by finding the section, area of the gangway or opening, in square feet, and multiplying this sum by the velocity of the air current per minute, gives the quantity of air in cubic feet supplied per minute. The quantum of air necessary to sustain the number of workmen, animals and lights in the mine, as required, may be readily calculated, and may be compared with the amount of air supplied. The instruments are constructed of a train of metallic toothed gearing, with a dial and indicators rising from 10 feet to 10 millions of feet. To this gearing is attached a number of vanes which the action of the air sets in motion, which operates the instruments, the diameters of which vary from 3 to 12 inches. These instruments, when well adjusted, are found to be entirely reliable where the air current is full, while, by its use, the supply needed can be known, and the ventilating apparatus be made to furnish a supply, or diminish it, as the case may be. By this means the air can be so regulated as to be sufficient to remove any deleterious gases that are found dangerous or troublesome to the men. A journal of the operation of the anemomiter is of vast importance to the manager, who, at any time of day, may refer to the state of ventilation, and see whether the persons entrusted with the direction of ventilating the mine is industrious or negligent in his duties. In no case should their use be objectionable to the operator or mine managers, as its use is of great importance to his interest as an operator.

THE THERMOMETER.

Third.—This instrument needs no description here, as its use is well known by most persons; but its use to a mine manager is of decided importance. By it he ascertains the outside temperature of the atmosphere. This he compares with the temperature of the mine in different locations. Where he finds an increase in the temperature inside, it indicates the state of that air to be warm, and when warm it necessarily expands and becomes buoyant, consequently favoring natural ventilation and showing that in such state it favors the production of gas, in

proportion to the degree of pressure thereby removed from the gas fissures, which freely combines with this air, causing explosions imminent. When this condition of the air becomes known, the mine boss brings into requisition the use of the safety lamp to enable him to ascertain to what extent the atmosphere is charged with gas and how far his workmen are secured from danger, which if found to be in a dangerous condition he forthwith takes measures to secure their safety. In extensive mines it is a most necessary auxiliary to the mine boss for the safety and protection of his workingmen.

THE BAROMETER.

Fourth.—This instrument scarcely needs a description in this connection, although the Aneroid barometer is the instrument used by the inspectors of this district, it being more convenient and portable than any other in use, being the size of a common watch, the index sweeping a dial numbered up to 32°, and an outer movable disk which marks altitudes up to 6,000 feet above sea level—it being exceedingly convenient for scientific persons to carry it about their person. When this instrument is used in the mines in connection with the thermometer, it indicates the condition of the air; if gas be present by a sudden fall of the index, and if a sudden rise is shown by the thermometer and a corresponding fall in the barometer, this change in the instruments indicates the condition of the air to be explosive. Owing to the atmospheric air being mixed with fire-damp the pressure is quickly removed, the gas being but one-half the pressure of atmospheric air. By aid of these instruments the miner may at any moment be able to intelligently ascertain the character of the surrounding element and govern himself accordingly.

Fifth.—The water gauge is quite another adjunct to insure the miner of the pressure of the air current, and furnish him with any system of ventilation. The instrument consists of a tube in the form of a siphon, some six to ten inches long by one-half inch in diameter. The tube is securely fitted to a board with the open ends turned upward and nearly filled with water. The tube is marked into inches and tenths of inches, so as to indicate a rise or fall in the water by the force of air brought to bear on one of the tubes, whilst the other end is shaded from the effects of the force of the air current as it passes through an aperture where the instrument is placed, so that at any time the superintendent desires to examine its operation he can readily see by its index the condition of ventilation during his absence, a register for which purpose is generally kept in mines where such instruments are kept for a proper record of the actual condition of ventilation from time to time. It is a common thing to have this instrument placed in such a situation that it may be accessible to all persons interested; that the most casual observer may determine the action of the air supplied.

Notwithstanding all these, the precautions that science may bring to the relief of the miner, unless he be an experienced, cautious person, he may, by the slightest careless step, become the instrument of his own destruction, as will numbers of his co-workingmen, when exposed to the prompt fury of this subtle agent—*fire damp*—so that nothing short of a proper supply of fresh air can render this dreaded element harmless. Therefore, for the proper ventilation of a mine, it is not sufficient to supply air enough to supply men, animals and lights, but a sufficient quantity should be provided for the removal of all deleterious effluvia, gases, powder smoke, the decomposition of animal and vegetable matter, and for refrigerating the surroundings, where the temperature is high, and artificially overcome the chemical action of these noxious elements, so that one hundred or more cubic feet of fresh air per man is not too high an estimate for the health and safety of miners in some collieries. No system of pipes can be relied upon for perfect ventilation—the volume of air required must be made to pass through the drifts and gangways and introduced into the working districts in spits and caused to return by back air courses out of all possible danger. The liability of men and boys to be run over by wagons in gangways and inclined planes should be met by strict discipline, to be provided with refuges along the gangways, with separate traveling ways, and intelligent signals, fences at shaft and slope bottom, to insist on such traveling ways to be used, proper care to be used in hoisting and lowering men into and out of the mines, care taken in blasting when the needle should be of copper and the ram-end of the tamping bar should be of copper also, safety-fuse should be used. The casualties which occur from choke-damp and fire-damp are generally attributable to negligence and daring in entering dangerous places. To reduce this class of perils a resort must be had to proper ventilation and good discipline.

Mining as a life-long occupation might excite some surprise that so many people will be found to brave its dangers, but the enemy being invisible and familiarity with mining are different things, and these dangers are the more readily overlooked. The work though enormous, is simple and requires but little skill in coal cutting, and in well-managed collieries the men seldom complain. Interfering with the proper organization of a colliery is an act of folly to the well being of all parties. A ship in a gale with all hands commanding and all reluctant to obey, is in no more a plight than a fiery coal mine stripped of its discipline, acknowledging no one in full authority.

COAL—BITUMINOUS.

Pennsylvania has within its territory the finest bituminous coal fields, affording every variety of coal and of the best quality. The Allegheny mountains bound it on the east and it extends south and west to the State line, and continues further south and west into Ohio and West Virginia and still further south. Its area in Pennsylvania alone exceeds 12,000 square miles.—*Rodgers.*

Owing to the rock formation rising towards the north and north-east faster than the surface does, in consequence of which each coal seam runs out as it dips northward, the lower seams appearing, which again give place to others in their turn. At Waynesburg, in the Monongahela district, the seam is found 233 feet higher than the Pittsburg seam. The coal is six feet thick. As it goes northward it rises still higher and finally runs out. At Brownsville the seam is found at the level of the river, and gradually rises until at Pittsburg, where it is 300 feet above the river, and it disappears on the hill-tops in Allegheny county. In the northern counties of the State only the lower coal seams are found on the high summits of mountains, and that, too, in small fragments.

On the Allegheny river the lower coal rock measures are 600 feet thick, and contain, besides the Sharon sub-conglomerate splint coal of Mercer county, five seams, designated A, B, C, D, E and F. Next above are barren measures, some 570 feet thick. Above this occur the upper coal measures, 240 feet thick, containing the Pittsburg seam. Finally, in Washington and Greene counties, above all are over 900 feet of upper barren measures, sandstone and shales, with six thin coal seams.

Throughout the whole field east and north-east of the Pittsburg district, the rock strata and coal seams are formed into a number of vast flexures, the course of which run generally north-east and south-west, dividing the field into six large basins, trenched in numerous places by ravines and valleys, rendering it of importance to its development.

The different kinds of coal produced in Pennsylvania may be classed into, first, anthracite, containing less than 12 per cent. of volatile combustible matter; second, semi-bituminous, containing more than 12 per cent. and not less than 18 per cent.; third, bituminous, containing as much as 20 per cent., and splint coal, containing some 37 per cent. of volatile combustible matter.

The anthracite is confined chiefly to Luzerne, Carbon, Schuylkill and Northumberland counties, with a small quantity in Dauphin. The semi-anthracite is confined to Sullivan and Wyoming counties. The semi-bituminous coal is found in Tioga, Bradford, Centre, Cambria, Huntingdon and Bedford counties. The bituminous coal is found in Fayette, Greene, Washington, Westmoreland and Allegheny counties. The splint coal is found in Mercer and Lawrence counties; some cannel coal exists, but not in any commercial quantity. But coal has been found in nearly all the counties lying west of the Blue Ridge, in more or less quantities, but awaiting railroad facilities for further developement, which is in rapid advancement for that purpose.

Pennsylvania, without exaggeration, has no rival in the Western Hemisphere as to her resources in fuel, oil, etc., nor in no State in the Union has there been so much capital invested in commercial and transportation facilities, progressive industry and enterprise. Its government thoroughly vindicated, the laws executed, property, liberty and religion protected, education and morality cherished, with a self sustaining population.

Prof. H. D. Rodgers had estimated the whole anthracite coal area to be 410 square miles. Mr. James M'Farlane, of Towanda, who has paid much attention to the subject, estimates it at 472 square miles, on the following basis :

Districts.	Miles long.....	Miles broad.....	Area in miles..	Square miles..	Districts.	Length.....	Breadth.....	Square miles...	Area in square miles.....
									433
Schuylkill.....	73	2	.....	146	Upper Lehigh....	.....	.....	.....	.....
Mahanoy..	25	2	50	.....	Hazleton	14	¾	10½	.....
Shamokin	20	2½	50	100	Br. Meadow.....	11	¾	8¼	.....
Wyoming, Lackawana and Carbon	50	3¾	187	187	Black Creek.	12	½	6	.....
					Little B. Creek...	7	⅝	2½	.....
					Lower B. Creek..	10	½	5	.....
					Green Mountain,	7	⅝	2¼	.....
					Other sm. basins,	.....	.....	3	37¼
Total square miles of anthracite area.....									433

The Pittsburg seam underlies an area somewhat less than 3,000 square miles in extent, containing 20,000,000,000 tons of coal, while the anthracite estimates 100,000,000.

The upper Freeport coal bed underlies an area twice as extensive as that of the Pittsburg bed, and the large bed of the lower bituminous coal series underlies an area three times as extensive, so that every part of western Pennsylvania is well supplied with coal. Many varieties of it exist, due chiefly to its condition.

Anthracite coals are distinguished by hard, soft and semi-anthracites; white, gray, pink and red ash coals; glassy, curly and boney coals. In like manner the bituminous coals are distinguishable into bituminous, semi-bituminous, fat coals, prismatic coals, high gas coals, laminated coals, block and splint coals, cannel coal, brash coal, etc. Block coal is a dry, compact, firm variety, valuable for the manufacture of iron, because, like coke, it is capable of sustaining the weight of ore and flux without being crushed in blast furnaces, and is characterized as being the lower beds of the coal measures, and is extensively mined in Ohio and Indiana. The conglomerate series, in western Pennsylvania, underlies all the workable coal measures and lies one-third up the coal measures in eastern Tennessee. The thin limestone bed which underlies it in the western counties of Pennsylvania, becomes in the southwestern states a great formation, named sub-carboniferous limestone. Therefore, an older system of coal measures, not present in Pennsylvania, appears to come in between this limestone and the conglomerate which lies upon it, thickening and receiving beds of coal as it approaches the Gulf of Mexico.

The trap dykes are prominent at Mount Joy, on the Harrisburg and Lancaster railroad; at Gwynedd, on the N. Pennsylvania railroad, and is finely exposed in York county. One of these trap dykes appears at the north foot of South mountain, in Cumberland county, traverses the great valley, passes near Carlisle, cuts through the North mountain, crosses the Cove mountain, the Juniata river, the Susquehanna river above Halifax, Berry's mountain near Millersburg, and ends at Wiconisco creek; is thirty miles in length and some four feet wide. Where it passes Duncannon furnace it is there connected with a bed of iron ore. At Cornwall, in Lebanon county, are found large beds of iron ore in beds of red sandstone, beds of trap, beds of magnetic iron ore mixed with copper, and white marble. The copper ores are found chiefly along the southern edge of the belt of new red sandstone near Phœnixville, in Chester county, on the Schuylkill river. At Phœnixville a fossil-bearing bed has been cut in the tunnel on the P. & R. R. R. It runs through Maryland, southern Virginia and North Carolina, on the Dan river, where six beds of coal had been recently opened, but in Pennsylvania there is no likelihood of a workable bed being ever discovered in this series.

IRON.

We extract from the report of Mr. Henry M'Alister, Jr., secretary of the Iron and Steel association, information in reference to the iron and steel production in the United States in the year 1872.

The production of anthracite pig iron in 1871 in the Lehigh region, was 372,000 tons, the product of the forty-three furnaces, many of which were out of blast for a considerable portion of the year. The production of the furnaces in the

Schuylkill region during the same time was 157,305 tons. The furnaces from Harrisburg down along the Susquehanna made 143,777 tons, and above Harrisburg 96,000 tons. The product of anthracite pig iron in the United States in 1871, was 957,008 tons, of which Pennsylvania made 714,700 tons. The production of raw bituminous coal and coke pig iron was 570,000 tons, making the total production in the United States 1,912,608 tons. The utmost present annual capacity of the blast furnaces of the United States is estimated at about 2,500,000 tons.

The total production of rails in the country in 1871, amounted to 775,733 tons. Of this amount 715,691 tons were iron, and 60,042 tons were steel and steel-headed. The following will show the localities where these rails were made:

States.	*Tons.*	*States.*	*Tons.*
Pennsylvania made	335,604	Maine made	13,383
Illinois made	91,178	Indiana made	12,778
New York made	87,022	Tennessee made	9,667
Ohio made	75,782	Missouri made	8,200
Maryland made	44,941	New Jersey made	6,700
Wisconsin made	28,774	Georgia made	7,846
Massachusetts made	28,861	West Virginia made	5,000
Michigan made	14,000	Kentucky made	6,000

The report received from the rail mills indicate that a large number were in operation during a part of last year. There are forty-eight rail mills in the country, and their utmost annual capacity is placed at about 1,000,000 tons. During the year 1871, the rails imported amounted to 572,387 tons, making the total consumption in the United States 1,348,119 tons. The product of the forges and bloomeries of the country amounted to 63,000 tons, and 10,000 tons below the average of the last ten years.

The estimated production of rolled and hammered iron, other than rails, is as follows: Merchant bar and rod, 330,000 tons; sheet and plate, 118,000 tons; hoop, 22,000 tons; nails and spikes, 155,000 tons; axles, etc., 80,000 tons; making a total of 705,000 tons. The product of steel is set down at 80,000 tons, of which 45,000 tons was made by the Bessemer process.

The number of persons employed in the production of raw and manufactured iron in the United States is given at 940,000, of which 140,000 persons are employed in the direct production of iron, and 800,000 in the manufacture of articles of iron. The value of this labor, if only paid at the rate of two dollars per day of 300 working days in a year, would amount to $564,000,000, and the value of the product at $900,000,000, divided as follows: Pig iron, $75,000,000; product of mills and forges at $138,000,000; and value of articles made from iron, 687,000,000.

An approximate estimate of the production of pig iron in the whole world, in 1871, in tons of 2,000 pounds, is as follows:

Countries.	*Tons.*	*Countries.*	*Tons.*
United States	1,912,000	Russia	330,000
Great Britian	6,500,000	Italy	75,000
France	1,350,000	Spain	72,000
Germany	1,250,000	Other countries	200,000
Belgium	896,000		
Austria	450,000	Total number made	13,315,000
Norway & Sweden	280,000		

It will be seen that Great Britain produces nearly one-half the iron of the whole world, with a population not as great as the United States. There is no country on the globe employs more labor, capital and machinery, and her untiring prosperity is due to her great practical knowledge of arts, and the sciences and the current use of money.

VELOCITY OF STEAM.

The velocity of steam, when flowing into a vacuum, is about 1,556 feet per second, when at an expansive power equal to the atmosphere; when at 10 atmospheres, the velocity is increased to about 1,780 feet per second, or 1,215 miles an

hour nearly. When flowing into the air, under a similar pressure, it is about 650 feet per second, increasing to 1,600 feet for a pressure of 20 atmospheres.

The boiling points of water, corresponding to different heights of the barometer, is given in the following table:

Boiling points of water corresponding to altitudes of the barometer between 26 and 31 inches.

Barom. inches.	Boiling point...	Barometer	Boiling point...	Barometer	Boiling point...	Barometer	Boiling point...
26.	204.91°	27.5	207.55°	29.	210.19°	30.5	212.88°
26.5	205.71°	28.	208.43°	29.5	211.07°	31.	213.76°
27.	206.67°	28.5	209.31°	30.	212.00°	....	....

Water expands corresponding to the degrees of temperature.

Temperature...	Expansion	Temperature...	Expansion	Temperature...	Expansion .....
12°	1.00236	82°	1.00312	152°	1.01934
22°	1.00090	92°	1.00477	162°	1.02245
32°	1.00022	102°	1.00677	172°	1.02575
*40°	1.	112°	1.00880	182°	1.02916
52°	1.00021	122°	1.01116	192°	1.03265
62°	1.00083	132°	1.01367	202°	1.03634
72°	1.00180	142°	1.01638	212°	1.04012

*Water is held to be at its greatest density when at 39.83°.

Hence, at 72°, water expands 1.00180, equal to 555.55ths of its bulk.

Fluids expand at 212°, the volume at 32°, equals 1.

Air.....	1.376	Ether.....	1.07	Mercury.....	1.02
Alcohol.....	1.11	Oil	1.06	Water...	1.04012

The ratio of expansions for solids and liquids increases with the temperature; that of the gases is uniform for all temperatures.

EXPANSION OF AIR.—(DALTON.)

Temperature...	Expansion	Temperature...	Expansion	Temperature...	Expansion .....
32°	1.002	60°	1.066	100°	1.152
33°	1.004	65°	1.077	200°	1.354
34°	1.007	70°	1.089	212°	1.376
35°	1.007	75°	1.099	302°	1.558
40°	1.021	80°	1.110	392°	1.739
45°	1.032	85°	1.121	482°	1.913
50°	1.043	90°	1.132	582°	2.028
55°	1.055	95°	1.142	680°	2.312

To compute the volume of gas at any temperature—its volume at 32° by 490—add the quotient to 1, if it is below 32°, and subtract 1, if it is above 32°, multiply the volume of gas at 32° by the resulting number, and the product will give the number required.

EXAMPLE:—What volume will 1,000 cubic feet of air at 32° acquire, by being heated to 1,000°?

Answer:—2,975¼ feet.

Thus:—1,000°—32°=968°, which ÷ by 490=1.9775, to which add 1=2.9775, then 1,000×2.9775=2,975¼ cubic feet.

By a careful observation of the above rule, we can easily ascertain the expansion of air at any given degree of temperature.

That a knowledge of these calculations is rendered necessary for the practical use of mine inspectors, there can be no doubt.

Expansion or dilation of solids. lineal foot, (Faraday,) as shown by the following:

To compute the temperature to which a substance of a given length or dimension must be submited or reduced, to give it a greater or less length or volume by expansion or contraction.

When the length is required to be increased:

EXAMPLE:—A copper rod 100 feet long, the temperature is at 32° Fahrenheit, to what temperature must it be subjected to increase its length to 1.1633 inches longer?

The expansion for a unit of length of copper for 180° is .001745, hence .001745÷180°=.00000694 for each degree.

Thus: $\frac{100\times12+1.1633-100\times12}{.00000694\times100\times12}+32°=\frac{1.1633}{.011633}+32°=132°$ Ans.

When the length is required to be reduced:

EXAMPLE.—Use the elements of the preceding case; then to ascertain the length, 1200×(1×.00000694×(132°—32°)=1200×1+0009694=1200×1.0009694=1201.1633 inches.

MEAN TEMPERATURE OF VARIOUS LOCALITIES.

London is	51°	Mexico is	71°
Edinburg is	41°	Polar region is	36°
Dublin is	52°	Globe is	50°
Rome is	60°	Hawaii is	72°
Equator is	82°		

SNOW LINE OR LINE OF PERPETUAL CONGELATION.

Latitude.	*Feet high.*	*Latitude.*	*Feet high.*
10°	14,764	50°	6,334
20°	13,478	60°	3,818
30°	11,484	70°	1,278
40°	9,000	80°	451

At the equator it is 15,260 feet; at the Alps, 8,120 feet; and in Iceland, 3,084 feet; at the Polar regions ice is constant at the surface of the earth.

TEMPERATURE OF THE EARTH.

The ratio of increase in its temperature is directly as the depth from the surface, being about 1° for every 65 feet. The temperature of mines are variable, in consequence of the force of the air currents passing through the mines where mechanical appliances are used to form a current, but where no air current is perceptible, atmospheric action materially affects the temperature, much more so in damp or wet mines than it does in dry mines, so likewise gases affect the temperature to a considerable extent.

Domestic gas.—A retort produces about 600 cubic feet in five hours with a charge of about 1½ cwt. of coal, or 2,800 feet in 24 hours.

Purifiers.—Wet purifiers require 1 bushel of lime mixed with 48 bushels of water for 10,000 cubic feet of gas. Dry purifiers require 1 bushel of lime to 10,000 cubic feet of gas, and 1 superficial foot for every 400 cubic feet of gas. A cubic foot of gas, the jet 1-33 of an inch in diameter, the flame 4 inches high, will burn for 65 minutes. Outside lights require 5 feet and indoor lights 4 cubic feet per hour. When pipes are laid inclined, either above or below the plane of the horizon, a correction must be made in estimating the supply, by adding or subtracting one hundredth of an inch from the initial pressure for every foot of rise or fall in the length of the pipe. The pressure should seldom exceed 2½ inches of water at the works, or the leakage will exceed the advantage gained by increased pressure.

Average duration of light in winter per day is 5.08 hours; in summer it is 2.88 hours; in spring it is 3.41 hours, and in fall 4.16 hours.

Street lamps in New York consume 3 feet of gas per hour, while in other cities 4 to 5 feet are consumed per hour. The standard of gas burning is a 15-hole Argand lamp, a 7-inch chimney, and internal diameter .44 inch, and consuming 5 cubic feet per hour, giving a light from common coal of 10 to 12 candles; with cannel coal, 20 to 24 candles; with rich Virginia coal and Pittsburg coal, 14 to 16 candles. Gas which at the level of the sea has a value of 100, would have but a value of 60 in the city of Mexico.

VOLUME OF GAS OBTAINED FROM A TON OF COAL, ROSIN, ETC.

	Cubic feet	Spec. gravity		Cubic feet	Spec. gravity
Boghead cannel	13,334	.42	Oil and grease	23,000	.67
Wigan cannel	15,426	.73	Picton and Sidney	8,000	
Cannel	15,000	.58	Pine wood	11,800	.66
Cape Breton	9,500		Pittsburg	9,520	
Cumberland	10,000		Resin	15,600	.66
English mean	11,000	.24	Scotch	15,000	.55
New Castle	10,000	.05	Virginia	8,963	
Kilkenny	12,500	.04	Wallsend	12,000	.42

Australian coal is much superior to Welsh coal for gas. 1 pound of peat will supply gas for one hour's light; 1 ton of wigan coal has produced 1,328 pounds of coke, 338 pounds of gas and 250 pounds of coal tar, and a waste of only 326 pounds.

GAS PIPES.

The flow of gas in pipes is determined by the rules governing the flow of water in pipes, the pressure applied is indicated and estimated in inches of water.

LENGTH AND DIAMETER OF GAS PIPES TO TRANSMIT GIVEN VOLUMES OF GAS TO BRANCH PIPES.

Volume per hour, feet	Diameter, in.	Length, feet,	Volume per hour, feet	Diameter, in.	Length, feet,	Volume per hour, feet	Diameter, in.	Length, feet,
50	.04	100	1,000	3.16	1,000	2,000	7.	6,000
250	1.	200	1,500	3.87	1,000	6,000	7.75	1,000
500	1.97	600	2,000	5.32	2,000	6,000	9.21	2,000
700	2.65	1,000	2,000	6.33	4,000	8,000	8.95	1,000

The loss of volume of discharge by friction in a pipe 6 inches in diameter and one mile in length, is estimated at 95 per cent.

GAS—AVERAGE COMPOSITION OF.

Aqueous vapor, 2; carbonic acid, .7; carbonic oxide, 7.5; light carboretted hydrogen, 39.5; nitrogen, .5 and olefiant gas, 3.8.

COMBUSTION, TEMPERATURE AND POWER OF GASES.

	Pounds of gas, oxygen used.	Water heated 1 degree.		Temperature of combustion, open flame...	Air heated one degree.....
		Per pound of material.	Per cubic foot of gas.		
	Cubic feet.		*Pounds.*	*Degrees.*	*Cubic feet.*
Alcohol	24.6	12.929	1597	4831	
Camphene	38.9	18.573	7134	5026	
Cannel gas	.31.	20.140	760	5121	36.585
Carbon	31.	14.544		3026	
Carbonic oxide	6.7	4.825	320	5358	15.403
Coal gas,	37.5	21.060	650	5228	31.299
Ether	30.9	13.219	3217	5150	
Hydrogen	47.2	62.080	329	5744	15.837
Marsh gas	40.5	23.543	996	4762	47.946
Olefiant gas	40.5	21.344	1585	5217	76.290
Parafine	38.7	21.327		5239	
Sperm oil	38.7	17.752		4937	
Spermacite	37.	17.230		4413	
Stearine	34.4	17.589		5095	
Sulph. hydrogen	16.7	18.001		4388	
Wax	37.7	7.414	671	4122	
Wood spirit	25.3	15.809	819	4641	

Temperature of Gases.—The combustion of a cubic foot of common gas will heat sixty-five gallons of water 1°.

WATER.

Fresh Water.—The constitution of it by weight and measure is—oxygen, by weight, 88.9, by measure, 1; hydrogen, 11.1, by weight, and 2, by measure.

One cubic inch of water (distilled) at its maximum density of 39°.83, the barometer at thirty inches, weighs 252.6937 grains, and it is 828½ times heavier than atmospheric air.

A cubic foot of water weighs 998.068 ounces, or 62.37925 pounds avoirdupois; for facility of calculation a cubic foot of water is taken at 1,000 ounces or 62.5 pounds.

STEAM BOILERS—*Natural Draft*.

Land steam boilers should be set at an inclination of one-half inch to the foot of their length.

Grates.—They should have a superficial area of one square foot for every 15 lbs. of coal required to be consumed per hour at a rapid rate of combustion, and should be set one-half inch in every foot downward inclination towards the bridge wall, to obviate the dressing of the fires and to increase the draft. When, however, the rate of consumption is not high, in consequence of the low velocity of the draught of the furnace, or the fuel being insufficient, this proportion should be increased to one square foot for every 12 lbs. of coal. With *wood* as the fuel, their area should be 1½ square feet that for coal, the width of the bars should be the least practicable, and the spaces between them from one-half to three-fourths of an inch, according to the fuel used.

Ash Pit.—The transverse area of it, for a like consumption of 15 lbs. of coal per hour, should be one-quarter the area of the grate surface for bituminous coal and one-third for anthracite. The velocity of the current of air entering an ash pit may be estimated at 12 feet per second.

Furnace, (for coal.)—The volume of it should be from 2½ to 3 cubic feet for every square foot of its grate surface. But for wood the velocity should be about 5 feet per second.

Combustion is the most complete with firings or charges at intervals of from 15 to 20 minutes.

The volume of smoke for each cubic foot of water converted into steam is from coal, 1,780 to 1,950 cubic feet, and from wood, 3,900.

Bridge Wall—(*Flue Boilers.*)—The cross section of the flues should have an area 2 square inches to every pound of coal consumed per hour, or 26 square inches for each square foot of grate, for a combustion of 13 lbs. of coal per hour; the difference in the area depending upon the character of the conformation of the section of and the length of the passage of the gases; the area being inversely with the diameter, and directly with the length of the flues or the spaces between them. Thus, in *horizontal tubular* boilers the area should be increased to 31 square inches; in *vertical tubular*, to 36 square inches; and when a *blast* is used the area may be decreased to 20 square inches.

The temperature of the furnace is about 1,000, and the volume of air required for the combustion of 1 lb. of bituminous coal is 155 cubic feet, which when exposed to the above temperature, makes the volume of heated air at the bridge wall from 450 to 470 cubic feet for each pound of coal consumed upon the grate.

When 13 lbs. of coal per hour are consumed upon a square foot of grate, $13 \times 2 = 26$ square inches are required, and in this proportion for other quantities.

The temperature at the ends of the tubes should be 500, and their area and the base of the chimney should be three-fourths of that over the bridge wall. The area of the bridge wall over the area of the flues should be from 7 to 8 over the lower flues, and 5 to 6 of the blast.

Flues.—Their areas should decrease with their length, but not in proportion with the reduction of the temperature of the heated air, their area at their end being 7 to 8 to their area at the bridge wall; large flues absorb much more heat than small ones, as the volume and intensity are greater.

The admission of air behind a bridge wall increases the temperature of the gases, but it must be at a point where their temperature is not below 800°.

Evaporation.—One square foot of grate surface, at a combustion of 13 lbs. of coal per hour, will evaporate 2 cubic feet of water per hour.

Water Surface.—At low evaporation 3 square feet of grate surface, and at high evaporation 4 to 5 square feet.

HEATING SURFACES.

The grate and heating surfaces should be increased .07 for sea water over that of fresh water.

RELATIVE VALUE OF HEATING SURFACES.

Horizontal surfaces above the flame=1	beneath the flame=1.
Vertical do. do. =5	tubes and flues=56.

A scale one-sixteenth of an inch in thickness wi l effect a loss of 14.7 per cent. of fuel. One square foot of fire-surface is computed to be as effective as three square feet of heating surface.

Western boilers.—In the boilers upon the western rivers and lakes of the United States, where the coal consumed is of the best quality, and the smoke stacks are carried to a great height, the combustion of coal per square foot readily reaches 40 pounds. One and one-eighth cords of western wood have been consumed per hour upon 48 square feet of grate surface.

To compute the heating and grate surface required for a given evaporation or volume of cylinder and revolutions:

Operation.—Reduce the evaporation to the required volume of cylinder, number of revolutions of engines, pressure of steam and point of cutting off; then reduce these results to the range of consumption of fuel per square foot of grate, pressure of steam and number of revolutions for the several cases above, and multiply them by the units given for the surface required.

Illustration.—There is required an evaporation of 492.24 cubic feet per hour under a pressure of steam of 17.3 pounds per square inch, stroke of engine 10 feet, cut off at one-half the stroke, 15 revolutions per minute and consumption of fuel (coal) 13 pounds per square foot of grate per hour, in a marine boiler having internal furnaces and vertical tubes.

Volume of steam at this pressure compared with water, 833. 492.24×833÷60=6833.93 cubic feet of cylinder per minute, 6833.93÷15×2=227.79 cubic feet of cylinder at half-stroke. Then 227.79-20=197.04 cubic feet at 17.3 pounds pressure, and 197.04-20×15=147.78, which ×66, the time of heating surface for a tubular boiler at 20 pounds pressure and 20 revolutions=9753.48 square feet, and 147.78×2=the unit for grate under a like condition=295.56 square feet.

BOILER PLATES, BOLTS AND JOINTS.

Boiler plates and bolts.—The tensile strength of iron plates and bolts range from 42,500 to 62,500, being increased when subjected to a modern temperature.

The mean tensile strength of copper plates and bolts is 33,000 lbs., being reduced when subjected to a temperature exceeding 120°, at 212° being 32,000 lbs., and at 550° but 25,000 lbs.

BURSTING AND COLLAPSING PRESSURE.

For computation for iron plates and bolts, without reference to the riveting, should be based upon a strength of two-fifths, that of the ultimate strength of the metal, and for use in fresh water upon one-half that of its ultimate strength, with copper one-half is a safe reduction for all purposes.

The resistance to collapse is much less than the resistance to bursting; the ratio or proportion cannot be determined, as the resistance decreases with its length, or that of its course. With an ordinary cylindrical boiler four feet in diameter, single riveted, 20 feet in length, with flues 15½ inches in diameter, shell five-sixteenths thick, flues ½ inch, the relative strength are: Bursting, 350 lbs; collapsing, 152 lbs. The following units are based on a tensile strength of iron of 52,500 lbs., and copper of 32,000 lbs.

To compute the thickness, maximum working pressure and diameter of an iron boiler or flue.

FOR SERVICE IN SEA WATER.

Thickness. Rule.—Multiply the diameter in feet, by the working pressure in pounds; divide the product by 1,260 for *square* riveting, 1,170 for *staggered*, and 900 for *single*, and the quotient will give the thickness in decimals of an inch.

Working pressure. Rule.—Multiply the thickness by 1,260, 1,170 or 900, as before given; divide the product by the diameter in feet, and the quotient will give the pressure in pounds.

Diameter. Rule.—Multiply the thickness by 1,260, 1,170 or 900, as before given; divide the product by the working pressure, and the quotient will give the diameter in feet.

EXAMPLE:—The diameter of a single riveted iron boiler is 4 feet, and the thickness of the plates is 5-16ths, what will be its maximum working pressure?

Thus:—5-16ths.3125.3125×900÷4=70.3+lbs; but for use in all calculations for fresh water, the preceding units are increased, viz;—1575.1460 and 1125.

TO COMPUTE THE DIAMETER OF STAY BOLTS.

RULE:—Multiply the distance between their centre in inches by the square root of the quotient of the maximum working pressure, divided by 5530 for sea water, and by 6900 for fresh water, for iron bolts, and by 5000 for copper bolts, and the quotient will give the diameter in inches.

The strength of iron stay-bolts should be computed at 1-7th for sea, and 1-6th for fresh water, of their ultimate strength, and for copper bolts 1-5th.

EXAMPLE:—The maximum working pressure of an iron boiler for use in sea water is 70 lbs., and the distance apart is 8 inches, what should be their diameter?

$$8\times\sqrt{\frac{70}{5530}}=8\times\sqrt{.01266}=8\times.1125=9 \text{ inches.}$$

TO COMPUTE THE DISTANCE APART OF STAY-BOLTS.

RULE:—Multiply the square root of the quotient of 5530 for sea, and 6900 for fresh water for iron bolts, and by 5000 for copper bolts, divided by the maximum working pressure, by the diameter of the bolts, and the product will give the distance in inches.

EXAMPLE:—The maximum working pressure of an iron boiler, for use in sea water, is 70 lbs., and the diameter of the stay-bolts is 9 inches, what should be their distance apart?

$$\sqrt{\frac{5530}{70}} \times .9 \text{ in.} = \sqrt{79} \times .9 = 8 \text{ inches.}$$

Stay-bolts when screwed and riveted are ½ stronger than when screwed only. A copper bolt screwed and riveted into a copper plate drew out at a strain of 16,265 pounds. Iron bolts ¾ inches in diameter, screwed into a copper plate ⅝ inches thick, drew out at a strain of 18,260 pounds. A like stay-bolt screwed and riveted into an iron plate, drew out at a strain of 28,760 pounds.

Thickness of boiler iron plates required and pressure allowed by the laws of the United States. Pressure equivalent to the standard for a boiler 42 inches in diameter and ¼ inch thick plate.

DIAMETER OF BOILER.

Wire gauge.	Thickness in 16th.	34 inches.	36 inches.	38 inches.	40 inches.	42 inches.	44 inches.	46 inches.
No. 1	5	169.9	160.4	152.	144.4	137.5	131.2	125.5
2	4½	158.5	149.7	141.8	134.7	128.3	122.5	117.2
3	4¼	147.2	139.1	131.8	125.1	119.2	113.7	108.8
4	4	135.9	128.3	121.6	115.5	110.	105.	100.4
5	3⅝	124.5	117.6	111.4	105.9	100.8	96.2	92.1
6	3⅓	113.2	106.9	101.3	96.2	91.7	87.5	83.7
7	3	101.9	96.2	91.2	86-6	82.5	78.7	75.3

RIVETED JOINTS.

Form and Proportions of Riveted Joints.

Thickness of rivets.	Diameter of rivets.	Multiplier.	Length rivets.	Multiplier.	Centre to centre of rivets.	Multiplier.	Lap in single joint.	Multiplier.	
								Single joint.	Double joint.
Inch.	*Inch.*		*Inches.*		*Inches.*		*Inches.*		
3-16	3-8	2.	⅞	4.5	1¼	6.5	1¼	6.8	11.1
1-4	1-2	2.	1⅛	4.5	1½	6.	1½	6.	10.
5-16	5-8	2.	1⅜	4.5	1⅝	5.2	1⅞	6.	10.
3-8	3-4	2.	1⅝	4.5	1¾	4.7	2	5.3	8.8
1-2	13-16	1.5	2¼	4.5	2	4.	2¼	4.5	7.5
5-8	15-16	1.5	2⅝	4.5	2½	4.	2¾	4.4	7.3
3-4	1⅛	1.5	3⅜	4.5	3	4.	3¼	4.3	7.2

The length of a rivet alike to a bolt, is measured from inside of its head. The multipliers are for computing the diameters, lengths and distances between centres of the rivets; also for the laps for single and double joints, by multiplying the thickness of the plate by the multiplier for the elements required.

In riveted joints exposed to a tensile strain, the area of the rivets should be equal to the area of the section of the plates, through the line of the rivets, running a little in excess up to 9-16th inches, and somewhat less beyond that diameter of rivets.

RELATIVE STRENGTH OF RIVETED JOINTS PER SQUARE INCH OF SINGLE PLATE.

Single lapped.—Machine riveted, 3 diameters from centres	25,000	lbs.
Hand riveted, 3 diameters from centres	24,000	"
Staggered set and equi-distant from centres	30,500	"
Hand riveted; a butt joint not "staggered," equi-distant from centres; single strip cover	30,000	"
Square set rivet single cover	42,000	"
" " double covers	55,000	"

The above deductions are here given by calculation from Haswell.

STEAM FANS.

Proportion of parts.—Blades: Their width and length should be at the very least equal to ½ the radius of the fan.

Openings.—The inlets should be equal to the radius of the fan, and the outlet should be in depth not less than ¼ the diameter, its width being equal to the width of the fan.

An increased number of blades or paddles renders the working of the fan smoother, but does not increase its capacity for ventilation. The eccentricity of a fan should be:

1. Of its diameter: By experiments deduced by Mr. Buckle, it is shown that the velocity of the periphery of the blades should be .9 that of their theorical velocity; that is, the velocity a body would acquire in falling the height of a homogeneous column of air equivalent to the required density.

2. That a diminution of the inlet from the proportions here given involved a great expenditure of power to reduce the same density.

3. That the greater the depth of the blades the greater the density of air produced with the same number of revolutions.

To compute the velocity of air discharged per minute:

$$\frac{a \times V \times 60'}{160} = V$$ in cubic feet; a representing the area of the discharge in square inches.

ILLUSTRATION.—The area of the discharge is 40 inches, and the velocity 123 feet per second,

$$\frac{40 \text{ in.} \times 123 \text{ ft.} \times 60 \text{ sec.}}{160} = 1{,}845 \text{ cubic feet.}$$

The Beadle suction fan, now in use at our collieries, is commonly made of six blades; the shrouding is formed of inch boards; the inlets are formed around the shafts of an area nearly ½ the diameter of the fan. The rims of many are left open all round for the free discharge of the discharged air, whilst many others are covered excepting an outlet opening on the rim. Builders generally differ in their opinions on the principle of construction for utility, contending that the open rim is the most effective, whilst they condemn the use of closed rims. Many experiments have been tried to establish a reliable opinion on this important subject, and the best authority states that the closed rim, (except the outlet openings,) with the side draw-holes, are by far the most effective; the blades running smoothly close to the rim and side covering, forcing the air along to the point where it is discharged into the outlet opening. In this way nothing can derange or interfere in the least with the passage of the air, whist in the open rim fan, the current of the atmosphere blowing into the open rim, counteracts the discharged air, and thereby retards the proper operation of the fan.

Some economists, in order to curtail expenditure in ventilating their mines, substitute any sort of inferior machine, whilst an existing necessity requires the adoption of a first-class fan to ventilate the mine. Many are the flimsy expedients resorted to by the advocates of this false economy, but the expenses in the end largely exceed any benefit derived from such management. The loss of health, and even life and limb is put in jeopardy; lost time to the miners, which is the operator's loss also, besides the loss in his business, creating a very large drawback in his business by the unwise management in non-ventilated colleries, which, in this item alone, lies the causes of bankruptcy, whilst in collieries that are properly ventilated none of these evils exist, the work of the colliery can be kept constantly going on, realizing some profits to the employer, which he could not obtain if his colliery had been poorly ventilated.

BELTS.

Belting is a subject which requires a knowledge of their general use. The resistance of belts to slipping on the different drums and pulleys upon which they may be used, is a matter of interest to operators and employees.

Their slipping is entirely independent of their breadth, consequently there is no advantage derived from increasing their dimensions beyond that which is necessary to enable the belt to resist the strain it is subjected to.

The ratio of friction to pressure, for belts over wood-drums, is, for leather belts when worn, .47; when new, .5; and when over turned cast iron pulleys or drums, 24 and 27.

A leather belt will safely and continuously resist a strain of 350 lbs. per square inch of section; and a section of .2 of a square inch will transmit the equivalent of a horse power, at a velocity of 1,000 feet per minute over a wooden drum, and .4 of a square inch over a turned cast iron pulley.

A vulcanized India-rubber belt will sustain a greater stress than leather, added to which its resistance to slipping is from 50 to 85 per cent. greater.

In high speed belting, the tension and the breadth of the belt should be increased, in order to prevent the belt from slipping. The longer the belt, the greater is its effect.

TO COMPUTE THE STRESS OF BELTS OR CORDS.

RULE:—Multiply the value of the co-efficient, from the following table, by the stress in pounds:

Proportion of arc embraced to the circumference of driving pulley.	VALUE OF CO-EFFICIENT. C. AIDE MEMOIRE.			
	Leather belts.		Cords on wooden sheaves.	
	On wood drums	On iron pulleys	Rough.	Polished.
.2	1.8	1.4	1.9	1.5
.3	2.4	1.7	2.6	1.9
.4	3.3	2.0	3.5	2.3
.5	4.4	2.4	4.8	2.8
.6	5.9	2.9	6.6	3.5
.7	7.9	3.4	9.	4.2

C.—The ratio of the resistance of a drum or pulley to slipping a belt or cord, when the resistance of a belt or cord upon the slack side is known.

EXAMPLE:—What is the stress a belt is capable of transmitting when the arc embraced upon the surface of the driving and wooden drum is .4 of its circumference, and the power or tension of the belt is 200 pounds? (See table)—opposite .4 is 3.3.

Thus: $3.3 \times 200 = 660$ pounds.

TO COMPUTE A STRESS WHICH IS TRANSMITTED TO A BELT OR CORD.

RULE:—Divide the power in pounds transmitted to the periphery of the pulley by the velocity of the drum.

EXAMPLE:—A cast iron pulley, 4 feet in diameter, driven by a 4 horse power, makes 160 revolutions per minute; what is the stress upon the belt?

Thus: $33000 \times 4 = 132000$ lbs., 1 foot per minute.

$4 \times 3.1416 \times 100 = 1256.64$ feet velocity.

$\frac{132000}{1256.64} = 105$ lbs. = difference of the stress upon the belt and the resistance of the slack side of the pulley.—$\frac{s}{c-1} = s$, and $s + s = p$; p represents the stress transmitted by a belt, s the resistance of its slack side, and p the sum of $s + s$, or the stress and resistance.

ILLUSTRATION.—What should be the resistance of the under or slack side of a leather belt running over the semi-circumference of a cast-iron pulley, 1 foot in diameter, driven by a power of 200 pounds?

Thus: $\frac{200}{2.4-1} = 142.85$ lbs.

(per table.)

TO COMPUTE THE REQUIRED WIDTH OF A LEATHER BELT.

ILLUSTRATION:—An engine of 4 horse power, the power to be transmitted through a leather belt over a cast-iron pulley, embracing .4 its circumference, .4 feet in diameter, and making 100 revolutions per minute; what should be the width of the belt?

Power as per preceding example, 132000 pounds.
Velocity " " 1256.64 "
S. " " 105 "

Then: $\frac{s}{c-1} = \frac{105}{2-1} = 105$, and $s+s=p=105+105=210$ pounds.

The resistance or tensile strength of a leather belt is from 270 to 350 lbs. per square inch; and assuming the thickness of it to be .15 of an inch, then $300 \times .15 = 45$ lbs. Hence $210 \div 45 = 4.67$ inches.

ILLUSTRATION.—A belt, 11 inches in width and .22 thick over a drum 4 feet in diameter, $c=.5$, making 60 revolutions per minute, is sufficient to transmit the power from an engine working at 990,000 lbs. per minute.

Then: $\frac{990000}{4 \times 3.1416 \times 60} = \frac{990000}{753.98} = 1313.3$ lbs., and $\frac{1313.3}{4.4-1} = 38617$, which $\times 2 =$ 772.35 lbs. Hence, $300 \times .22 = 66$, and $\frac{772.35}{66} = 11.7$ inches.

VULCANIZED INDIA RUBBER BELTING.

Adhesion of gum and leather beltings as per experiments.

J. H. CHEEVER.

RUBBER.	lbs.	LEATHER.	lbs.
Belts slipped on iron pulley, at....	90	Belts slipped on iron pulleys, at.....	48
Belts slipped on leather pulley, at..	128	Belts slipped on leather pulleys, at..	64
Belts slipped on gum pulley, at....	183	Belts slipped on rubber pulleys, at..	128

Hence it appears that a rubber belt for equal resistances with a leather belt may be reduced, under the circumstances here given, respectively 46, 50 and 30 per cent., from the results to be obtained by the foregoing rule.

The computations here given are based upon the actual horse power.

STEAM BOILER EXPLOSIONS.

Belgium had 90,578 steam boilers in use within the last ten years, between the years 1860 and 1870, with a total of 71 explosions, 96 deaths and 65 wounded. In England, from 1861 to 1870, there were 411 steam boiler explosions, killing 639 persons and wounding 782. It is a noticeable fact that in Belgium, England and France the proportion of deaths to explosions is very nearly 1½ to 1. No similarity exists in the proportion of wounded. There is, however, no regularity at all, when it is to be considered the occurrences year by year. These facts were shown at the meeting of the Alumni association of the school at Leige, Belgium, and they were collected with a view to ascertain whether some standard could not be discovered which would increase our knowledge of the cause of explosions of steam boilers. This expected knowledge was not then derived, but other significant facts were developed, which are of great importance. For instance, the English Boiler insurance and steam company made, by its inspectors, 49,163 visits in 1871, and found 1,963 safety valves in bad condition or overpoised; 676 manometers out of order, and 452 water level indicators also in bad condition. Here were 2,820 opportunities for explosions, which a kind Providence saved the people from, and the discovery of which shows that these disasters can be prevented by proper care.

These investigations into the cause of steam boiler explosions form a part of that general inquiry into industrial disasters, undertaken for the purpose of relief to humanity of the fearful risks which attend the operations of man on their present extended scale. Steam cannot be now dispensed with, because it gathers its victims; for steam at present is the moving power of the world. But a constant study of the cause of its destructive power and narrowing down restrictions upon carelessness and more rigid inspection will undoubtedly relieve us of very many of the dangers to which operatives are now subjected and many valuable lives endangered.

There is a constant crying demand that something more should be done by scientists for the security of life and limb than that which is done up to the present, to protect us from universal disasters from steam boiler explosions. The security rendered so far by experts in this branch is indeed wonderful, but fails utterly of the security needed, or of satisfactory results. The subject is unfortunately still open and unexplained, although the dangers are rapidly on the increase in every civilized nation, yet so far true science has failed to fully determine the true cause. Upon the report of some dreadful disaster, faint attempts are made to explain away the causes, many of which have but the slightest foundation of facts, as the interest of parties are consulted, paramount to science and truth.

The dreamy theories and flimsy speculations that are set afloat, that really are but shadows, are taken as facts by the common engineer, and limited on their part, that steam boilers cannot be exploded while a full guage of water can be maintained, with free safety valves, and a competent engineman to run the machine, "while the iron is considered good." It would be well for the world if this was the case, as they all are controlable causes, but unfortunately steam boilers continue to explode, despite the most watchful precaution of the engineman, full water line, reasonable steam pressure, and good boiler iron. They explode, too, when circumstances wipe out all evidence that none of the above careful provisions could have averted the disaster, tearing the very best metal into fragments, and hurling whole boilers to a great distance, with such terrible force seemingly far beyond the power of steam. The theorists have given the public various speculative assertions, but they sadly fail to substantiate any proper fact. The globular condition which boiling water is capable of assuming was a notable and for a time a popular instance, but as the conditions, a red hot metal is impossible within a steam boiler while the water is in contact with the iron, it is evident the cause must be attributed to some other source. The explosion of the steamer Mosella, at Cincinnati in 1838, with the loss of 200 souls, has never been explained. Low water has been assigned by experts to be the cause, yet it is known of an instance in that city in which the water leaked out, and the boiler got red hot while still under the pressure of steam, nevertheless the water utterly refused to "spheroid" or suffer itself to be decomposed into its constituent gases. Old enginemen know of many such cases. Neither is high pressure a requisite of an explosion. The propeller Globe arrived in the harbor of Chicago in 1860, at 4 o'clock in the morning, with 80 pounds of steam. The fires were allowed to die out, and at 11 A. M., with only 10 pounds of steam, her boilers exploded utterly destroying the boat. The New York ferry boat, Whitfield, is an evidence of many occurrences of this class of explosion. The Whitfield had but 27 pounds of steam on when the boilers and boat were torn into fragments, causing the loss of nearly 100 persons.

These explosions cannot all be attributed to bad iron. Railroad statistics furnish more than a few instances in which locomotive boilers containing 100 to 150 flues, and consequently must be difficult of a thorough or frequent examination; that when examined in the shop for general repairs, have been discovered with whole sections of the boiler corroded, until a mere shell, as thin as a sheet of paper, was all that held the water, and 100 to 110 pounds of steam pressure, and yet these boilers did not explode, whilst an ordinary stroke of a hammer could penetrate the boiler, yet new boilers just from the shop have exploded under ordinary pressure.

Explosions must be attributed to other causes than bad iron only. It may be readily seen by the seeker after truth, that there lies within the iron walls of the steam boiler, as ordinarily used, a mysterious power which science, experience and prudence have failed to explain. Hence the folly of stocking a coroner's jury with persons who know little about steam power. As long as the verdicts compromise nothing more than the customary condemnation of the dead engineer, the censure of the boiler maker, who tested his boiler by hydraulic pressure of

300 pounds to satisfy himself of its fitness, and the stale presumption of "low water" over pressure and the like, it can be looked upon as a stigma upon the pretented intelligence and scientific knowledge of the age.

To what causes, then, may steam boiler explosions be assigned? Is it to bad iron, low water, carelessness, over-pressure, that the cause must be attributed to? All of which are sufficient to produce it, cannot be denied. But the exploding and bursting of a boiler is not alike; the latter consists of the yielding or giving away of a weak part of a boiler, and letting out of steam and water. These occurrences are numerous, and not attended with very serious results, except in scalding those who are in the line of the escaping water. The boiler is seldom moved out of position, nor torn from its strongest parts.

An explosion is the contrary in its nature; the boiler gives way, regardless of its weakest parts, and the strongest and best boiler plates are torn into ribbons, and thrown surprising distances, with surprising force, leaving very little traces of water.

A belief is gaining in the minds of practical and observant experts that impurities in the feed water are an important source of danger, which, strangely enough, has been overlooked. Water, being a natural compound of oxygen and hydrogen, and contains by weight 88.9 of oxygen, and 11.1 hydrogen, and by measure oxygen 1, and hydrogen 2. One cubic inch of water, at its maximum density of 39°, (83 the barometer,) 30 inches weighs 252.6937 grains, and is 828¼ times heavier than atmospheric air. A cubic foot of it weighs 62.37925 pounds avoirdupois. At a temperature of 212°, its weight is 59.675 pounds, and the weight of a cubic foot of ice is but 57.25 pounds. It expands .089=1.1124 of its bulk in freezing. From 40° to 12°, it expands .00236 of its bulk, and from 40° to 212°, it expands .04012=.00023325 for every degree, giving an increase in volume (40 from 40° to 212°) of 1.04012=1 cubic foot in 24.92 feet; 35.84 cubic feet of water weighs a ton, and 39.13 cubic feet of ice weighs a ton.

When water is pure it will not become turbid or produce a precitate with any of the following re-agents:

Baryta water—if an opaqueness appear carbonic acid is present.

Chloride of barium indicates sulphates.

Nitrate of silver indicates chlorides.

Oxatate of ammonia indicates lime salts.

Sulphide of hydrogen, slightly acid, indicates antimony, arsenic, tin, copper, gold, silver, lead, bismuth.

Sulphide of ammonia indicates nickel, cobalt, magnesia, iron, zinc, alumina and chromium.

Chloride of mercury indicates sulphate of zinc, indicates organic matter.

Mineral waters are classed into 5 groups, viz:

1. Carbonated—containing pure carbonic acid, as Seltzer, Germany; Spa, Belgium; Prymont, West Philadelphia; Seidlitz, Bohemia, and Sweet Spring, Virginia.

2. Sulphurous—containing sulphuretted hydrogen, as Harrowgate and Cheltenham, England; Aix-la-Chapella, Prussia; Blue Lick, Kentucky; Sulphur Springs, Virginia.

3. Chalybeate—containing carbonate of iron, as Hamstead, Tunbridge, and Brighton, England; Spa, Belgium; Ballston and Saratoga, New York, and Bedford, Pennsylvania.

4. Alkaline—containing carbonate of soda. These are rare, as Vichy, Ems, etc.

5. Saline—containing salts, as Epsom, Bath, England; Baden Baden and Seltzer, Germany; Kissingen, Plombiers, France; Lucca, Italy; Yellow springs, Ohio; Warm springs, N. C.; Congress springs, N. Y., and Greenville, Kentucky.

RULES TO ANALYZE WATERS AND TO DETERMINE TO WHICH OF THE ABOVE CLASSES THE WATER BELONGS.

1. If the water reddens blue litmus paper before boiling, but not afterwards, and the blue color of the reddened paper is restored upon warming, it is carbonated.

2. If it gives off a nauseous odor, and gives a black precipitate with acetate of lead, it is sulphurous.

3. If, after the addition of a few drops hydrocloric acid, it gives a blue precipitate, with yellow or red prussiate of potash, the water is chalyleate.

4. If it restores the blue color of litmus paper after boiling, it is alkaline.

5. If it possesses neither of the above properties in a marked degree, and leaves a large residue upon evaporation, it is a saline water.

River water contains 1-20 and spring water contains 1-14 of its volume of gaseous matter.

A cubic foot of sea water weighs 64.3125 pounds, and 34.83 cubic feet of it weigh a ton.

Water will solidify at a temperature of 32° Fahr., and at an elevation above the sea line of 531 feet it will boil at a temperature of 212° Fahr., and just as the pressure is increased we must also raise the temperature to produce the same effect. While this is true of pure water, it is far different with waters containing impurities or foreign substances. Even the presence of artificial matter, that is, matter not in true solution, will greatly influence the conditions of evaporation. Take a vessel containing pure water and another containing a few grains of sand, the first will evaporate steam with the usual currents of the water, while the latter vessel, which contains the few grains of sand, will suffer violent ebullition. Water containing any greasy or oily substance will display very singular phenomena. Molten iron had been dropped into water where workmen washed and used soap freely, an instant flash—an explosion; the metal was thrown up to the roof, and as often as it was repeated this was the result: but when the hot metal was dropped into pure water, no explosion ensued, only a bubbling, sizzing of escaping steam.

River and harbor waters are loaded with abundance of foreign matter and earthy salts, which, to a certain extent, unfits the same for steam boilers, without first evaporating it in tanks to purify it, but this would be an expensive job. A chemical analysis of the Mississippi water, taken below the mouth of the Missouri river, showed nearly 6 grains nitrogenous matter (albumen) to the gallon, and with the presence of earthy matter, fats or oils, and alkalies derived from the decomposition of animal and vegetable substances, might be set down as extra hazzardous at high temperatures.

High authority says: "The instability of all nitrogenous compounds is the striking peculiarity." These elements are held together by fickle affinities, and have a proneness to decomposition when deranged by heat or molecular disturbances. Viewing the Ohio river in the same light, it is nothing short of a sewer on a large scale, the drainage of petroleum regions, slaughter-house drainage, gas and refuse, etc., into one channel, the rains wash the slimy refuse of numerous valleys into this feed-water of decayed vegetable matter, the nitre-beds of Kentucky, and the mineral sewerage of the contiguous States, furnish their quoto of the mixture which is used in steamboat and stationary engine boilers. If such impure water will exhibit such remarkable explosive powers in the chemists laboratory, is it not reasonable to suppose that when subjected to high temperature in steam-boilers, it may manifest similar phenomenas.

All new boilers contain more or less grease as they come from the shop, and for a few days the water foams furiously, and every observant engineer knows that at times of freshet, when these waters are loaded with animal, vegetable and mineral impurities, there is much annoyance occasioned from foamings, and the gauges are often clogged and troublesome. To what then may explosions be assigned?

It is well known that some boiler explosions, by the fact that when water has been boiled long enough to lose its air, it does not become steam gradually as before, but the whole mass is suddenly converted into vapor. Faraday, to obtain water without air, availed himself of the extraordinary power possessed by bodies in crystallizing, of excluding air. Water in freezing takes up its crystalline form and excludes everything extraneous to itself. The experiment was performed: A lump of ice was placed in a clean test tube in an oil bath, and just covered with oil, the whole being covered by a glass jar to prevent scattering the oil. When the water boiled it did so with a sharp explosion, violently discharging the oil into the air. Another tube containing common water covered with oil boiled tranquilly.

Steam boiler incrustations is a serious drawback to security of life. Dr. Chandler, I think, offered some years ago a plan to prevent incrustations in steam boilers, which often cause explosions. The Dr. said: Boiling expels the carbonic acid, and causes the separation of the carbonates of lime and magnesia, and if conducted at a high pressure, under considerable pressure, results in the almost complete precipitation of the sulphate of lime. It would merely transfer the incrustations to another vessel and leave the water free from foreign matter." The proposition was to have the water boiled before entering the tank, that the

impurities in the water would be precipitated. It certainly offers the simplest method of dealing with incrustations. Thus at watering stations along the line of road, a steam tank can be used, connected with a pumping engine or steam pumps, of a capacity sufficient for heating the required amount of water, into this tank the exhaust pipes could be laid, the steam and heat could be utilized to advantage, and the water purified of all impurities. The cost of such improvements would be but small in comparison to the gross repair bills to a railroad company. The heating tank to be closed, the water to be heated to the boiling point, would subject it to a pressure of 15 pounds to the square inch. A tube leading from the boiling tank to the receiving tank would drain off the pure water and leave the calcareous matter in the heater, which could occasionally receive a cleansing, and this process repeated as often as is necessary, thus keeping up the supply according to the demand.

It is estimated that 1,000 gallons of water can be heated to the boiling point with 172 lbs of coal=30½ cents, or 8,000 gallons heated by one ton of coal, at $2 50 per ton. To purify the water for one locomotive during one year will cost 94 tons of coal, at $2 50 per ton, amounting to $235 20. To this add the cost of the boiling apparatus, say $550 00. This apparatus will boil water for many other engines. Fully 75 per cent. of locomotive repairs is owing to incrustations; so under favorable circumstances there would be a saving of over $400. But the gain is even greater than this. The conducting power of incrustation is very low; and as, after four months, there will be in the locomotives on western roads a crust of one-sixteenth of an inch thick, so a much greater heat must be maintained to raise steam in crusted steam boilers than if it were free. The thicker this crust, the higher must the temperature of the fire be raised to supply the required amount of steam, which no doubt will expose some parts of the metal to an overstrain and fracture. The entire saving is not less than $700, less the cost of coal. This gives an annual profit of not less than $464 80. This calculation is not the result of experiment, but an accurate estimate deduced from practical conclusions. The question is of importance to coal operators and land-owners generally, to furnace men, railroad and canal companies. The saving will in their case be in the item of repairs and safety of the employees.

APPOINTMENT OF MINE INSPECTOR.

The principle of examination of candidates for that important position is a sound one, and no reasonable objection whatever can be brought forward against a careful inquiry into the becoming fitness of a candidate to prove his practical knowledge and scientific qualifications to fill the position and discharge the duties of the appointment, and prove his particular fitness above other candidates in competition for the office. But against the manner and form in which examinations have been conducted in the examination of candidates for Mine Inspectors in the past and in part of the anthracite coal region, there is a great deal of sound and sensible objection that may be truthfully brought forward. The commission who are appointed by the courts for discharging that critical duty, ought to be persons of intelligent, discriminative ability, ripe in experience, capable of distinguishing the business powers—the scientific as well as the practical knowledge, the mental capacity and moral character of the candidates who may come before the board—otherwise their deliberations will become the subject of ridicule. The class of candidates who present themselves for examination generally have not the requisite attainment, but are prompted by a sort of singular selfishness, characteristic of ignorance and uncultivated minds, who, many of them, are more to be pitied than to be blamed, lacking the very first essential principles requisite and most necessary to a good inspector of coal mines, whilst men of higher culture and practical experience shrink the ordeal of an examination suspecting their inability to succeed or to risk their reputation at the hands of the commission.

When examiners come to deal with practical and scientific men, who add the faculty of fair criticism and executive ability to an intimate and varied experience of mining, the question presents increased difficulty. Who shall be taken or chosen? Is it the practical candidate familiar with all the details of the work as it is carried on, or shall the scientific man be chosen who knows how the work should be carried on? To combine these two requisites in one person is a matter of difficulty, especially at the rates paid and the labor to be performed, that it is almost an impossibility. The duty of the government to its people and its dealing with the owners of the industry which requires strict supervision, is a matter of much con-

cern, the government claiming the right to protect human life as of the first principle, the operators holding that their business should be carried on and that restrictions should not be oppressive. In the matter of mine inspector it is utterly impossible for him to bring to his aid too much accurate knowledge of theory or too much practical experience, for both should be necessarily combined in the officer of the government. The lack of either essential qualification unfits him for the proper discharge of duty. Besides this, he should be possessed of a decisive mind, fearless in his undertakings, neither give to the one nor take from the other aught but what was justly their due. At the head of this commission and in fact all the board should be persons well informed in science. The inspectors should be men of ability, imposing no more requirements than what are reasonable, practical, beneficial and necessary. To carry on the work in safety all their instructions should be sensible, the plans possible, take timely advantage of circumstances, and this scheme has the advantage of testing criticism and of recommending itself to inspector, master and miner alike, who see their interests committed to practical, honest men of their class.

The method proposed by the present English law is looked upon as a good one. The home secretary is to designate three owners, three practical miners and three mining engineers, and this commission in conjunction with the inspector of the district, is to select examiners, who will inquire into the fitness of the manager of the mine. It is intended to suffer none to have the management of a colliery except persons who give satisfactory proof under examination and possess the requisite qualifications and vouched for by competent certificates as a means of ascertaining their real ability, and this method gives promise of as good results as any plan yet devised.

All classes who are interested in mining coal and working in coal mines should be satisfied that the selection of the inspector by the examining board is satisfactory, and looking at the action of the commission, the people should have the right to appeal to the courts when an imposition has been practiced upon them, nor should the unwarrantable acts of the board of examiners be tolerated a moment longer than the interest of the miners and laborers in mines is regarded as unsafe, a great responsibility rests on the commission in making their examination. Public interest requires the candidate's fitness for the position and that he discharges the duties of his office with fidelity and promptly, otherwise the lives of many valuable persons are endangered, distress and ruin brought on families, and the law itself made a mockery of and a snare in the hands of incompetent men.

Weight of T rails in pounds per yard, and in tons of 2,240 pounds per mile—Standard weight at Benjamin Haywoods', Esq., rolling mills at Pottsville, Schuylkill county, Pa.

	Tons.	*lbs.*	
At 16 pounds per yard it requires	25	325	per mile.
At 18 pounds per yard it requires	28	640	per mile.
At 20 pounds per yard it requires	31	660	per mile.
At 22 pounds per yard it requires	34	1280	per mile.
At 25 pounds per yard it requires	39	640	per mile.
At 28 pounds per yard it requires	44	....	per mile.
At 30 pounds per yard it requires	47	320	per mile.
At 33 pounds per yard it requires	51	1920	per mile.
At 45 pounds per yard it requires	65	960	per mile.
At 48 pounds per yard it requires	75	960	per mile.
At 68 pounds per yard it requires	106	1920	per mile.

The above table will serve to approximately estimate the cost of a mile of any size T rail, now in common use about the mines. Is useful and convenient for almost all purposes, and will serve the purposes of mine managers for close estimates. Three pounds of iron are estimated to be worn off railway bars for each ton carried one hundred miles distance over the railroad.—*President Gowen's report*, 1872.

CAR WHEELS.

It is consistent with mine economy to notice car wheels in connection with mine statistics, and the savings gained in this item alone are evidently of great importance to coal companies, as well as to the individual operator. There are at present not less than 120 different patterns of car wheels in use, many of which

are worthy of note. It is not our purpose in this place to show the superiority of one pattern above the others, having no interest in the matter further than long experience in the different sorts. We found the Whitney plate wheels to equal and, if anything, to be superior to any other pattern now in use for all practical applications and for durability, being much less liable to injury, injudicious application of severe breakage or hasty usage, which is not the case with all the spoke wheel patterns. The Gardner and Christian self-lubricating plate wheel is also deserving of notice, though this pattern is but recently brought into use at the mines, but is being largely patronized by our coal operators. There are many other wheel patterns in use whose advocates claim for them all the necessary qualities for real economy, but which often have proven to be far below the standard claimed for them when used upon our mountain grades under severe trials, under heavy trains and fast running.

DRUMS.

Brakes attached to drums are of great necessity, and the supplying of proper and safe brakeage for drums that are used in operating in shafts, slopes and on inclined planes is a matter which should seriously engage the especial attention of mine inspectors, operators and managers of coal mines. Although the act of Assembly of 1870 requires that such appliances shall be so secured to drums as to make their operation safe and secure, we yet find many cases where this matter receives but very little attention, and the operators seem to be quite indifferent in the matter, but substitute any sort of trumped-up contrivance for the time being, which may supply a temporary want, and thereby endanger the lives of persons, besides the damage that will surely arise from accidents occasioned by negligence and bad and inadequate brakeage. Drums should be so constructed as to have the brake placed in its entre on its periphery; the break to be made of an iron band some six inches broad and of the necessary thickness, running upon an iron ring or disc with sufficient leverage near the hand of the engineer that the operation of the drum may be at his command; and that by a slight movement he could direct and control its action. The cost of such a brake would in a short time repay the operator.

Persons entrusted with operating shaft, slope and incline plane engines and machinery, and whose duty it is to lower and hoist men on such contrivances as are applicable to such openings, and having, in part, the lives and safety of these persons in their hands, should be persons of sound and intelligent judgment, having full and free control of his business without let or hindrance, possessed of temperate and steady habits, not prone to hasty or rough temper, having the interest of his fellowmen and fear of a just God at heart, to be fully acquainted with all the minutia of the machinery, the condition of the shaft and slope ways, the necessary strain and speed, the strength and resistance to the operation of the machinery, and to frequently visit and inspect the same; to see every part of the bearings well oiled, to prevent friction, so as to be at all times cool to the touch, and to pride himself upon his perfect knowledge and his avocation; for every thing have a place, and a place for every thing, in their proper order. The services of such a person is eminently invaluable, compared with the services of the ignorant, sloven, careless blusterer, who never has an interest in his employment; if he can read at all, he is sure to read vulgar matter of the lowest type, lounging idly, that his person is a burthen to him, surly, dogged and insolent; he may be a mechanic, too, but his habits unfit him to be employed about mine machinery, where the lives and safety of persons are at stake—his real place would be in some low doggery, loafing away his time amongst such associates. I am persuaded to make this mark of distinction between the different classes of stationary engineers that are met within the district. This subject may appear severe to some, nevertheless it is too true, and think it but our bounden duty, in connection with this subject, to reprove where apparent and real negligence belong. Although I may incur their displeasure by this hint, a glance at our death statistics during the last four years, will convince the public that these remarks are justifiable, when we connect these deaths and casualties, and the misery entailed upon widows and orphans by careless and negligent persons.

Although they may escape, "as often they do," the censure of the community, yet before their God they are responsible as accessary to the destruction of human life. To show the truth of this assertion, visit the many engine houses in this region, and the evident examples of carelessness is visible. Valuable machinery is found encased in filth and oil, the steam-valves overloaded with old rusty debris laying around every where, the wall covered over with vulgar papers and

readable matter, the engineer listlessly lounging with a gruffness unbecoming his responsible position.

SLOPE AND SHAFT HANDS.

Persons who are employed as top and bottom men at shafts, slopes and incline planes, are, in a great measure, culpable for casualties that occur in such places. Many of which lack the requisite energy to enforce the rules and regulations promulgated by the employers, in forbidding the men crowding upon the cages and wagons that are used for lowering and hoisting persons into and out of the mines. I may here assume the risk of incurring the displeasure of many of this class, by giving publicity to their timid and vacillating conduct, whilst the safety of the other employees are, in a great measure, placed in their hands. But on the score of humanity I will reprove such conduct wherever found; and *vice versa*, will always approve the praiseworthy conduct of any man who will faithfully discharge his duties without fear or favor, whilst the safety of persons, in a great measure, rests in his hands.

Breaking strain of wire ropes. Tests furnished by Mr. Robling, wire rope manufacturer, Trenton, New Jersey.

ROPES OF 133 WIRES.						ROPES OF 49 WIRES.				
Trade number	Circumference in inches.....	Diameter in inch's,	Price per foot.....	Breaking strain in tons of 2,000 lbs...	Circumference of hemp ropes of equal strength.....	Trade number	Circumference in inches.....	Price per foot, cts....	Ultimate strength in tons of 2,000 lbs,	Circumference of hempen ropes in inches of equivalent strength.....
1	6¾	2¼	$1 20	74.00	15½	11	4⅝	54	36.00	10¾
2	6	2	1 05	65.00	14½	12	4¼	47	30.00	10
3	5½	1¾	91	54.00	13	13	3¾	41	25.00	9½
4	5	1⅝	78	43.60	12	14	3⅜	35	20.00	8¼
5	4⅜	1½	65	35.00	10¾	15	3	29	16.00	7¼
6	4	1¼	53	27.20	9½	16	2⅝	23	12.30	6¼
7	3½	1⅛	41	20.20	8	17	2⅜	18	8.80	5½
8	3⅛	1	34	16.00	7	18	2⅛	15	7.60	5
9	3	⅞	28	11.40	6	19	1⅞	13	5.80	4¾
10	2½	¾	25	8.64	5	20	1⅝	11	4.09	4
10¼	2	⅝	24	5.13	4½	21	1⅜	9	2.83	3¼
10½	1⅝	9-16	23	4.27	4	22	1¼	8	2.13	2¾
10¾	1½	½	22	3.48	3¾	23	1⅛	7	1.63	2½
						24	1	6½	1.38	2¼
						25	⅞	6	1.03	2
						26	¾	5½	.81	1¾
						27	⅝	5	.56	1½
						27½	½	4	.25	....
						28	.....	3	Lar. sash cord	....
						29	.....	2	Sm. sash cord	....

For a safe working load allow 1.5 to 1.7 of ultimate strength, according to speed and vibration. Drums, sheaves and pulleys should double the diameter in feet that the rope is in inches in circumference, but never under the minimum of the rope circumference. Ropes will wear double as long upon large drums, and also with the speed; it is better to increase the load than the speed. A hempen centre wears much better than a wire centre on short bends, and should not be coiled or uncoiled like hemp ropes. All twists must be carefully avoided. Raw linseed oil is the best preserver when mixed with lamp-black. The best preserver under water for ropes is three-fourths of tar to one-fourth slacked lime, to coat it over.

VENTILATION OF MINES.—*Greenwell & Atkinson.*

The volume of air necessary to sustain a man appears to be 27.8 cubic feet per hour. The lungs scarcely absorb any nitrogen and only three parts of oxygen out of every 100 parts of atmospheric air; thus the air expired contains only seventy-nine per cent. of nitrogen and eighteen per cent. of oxygen. The three parts of oxygen are re-placed by their equivalents in carbonic acid and vapor of water.—*Annals des Mines, first series, Vol.* 10.

Thus, 150 workmen, employed eight hours in a mine, will respire 33,301 cubic feet of air, which is about equal to 70 cubic feet per minute. They will absorb in the act of respiration 999 cubic feet of oxygen, and restore to the bulk of the volume of carbonic acid, (black-damp,) and nearly 3,765 cubic feet of nitrogen, which will remain in excess over the proportion of common air.—*Ponson, Traite de L'Exploitations des Mines de Homille, Vol. II, p.* 5.

Five cubic inches of nitrogen are consumed every minute by an ordinary man, according to Dr. Henderson and Sir Humphrey Davy. Allen and Pepys say that azote is given out by the lungs, and Ellis has labored to show that in respiration the natural nitrogen of the atmosphere is untouched in quantity and unchanged in quality.

The combustion of lamps absorb a quantity of oxygen which depends on the nature and weight of the substance burnt in a given time. There are at the present produced carbonic acid and vapor of water. Ordinary mine lamps require some ten cubic feet of air per hour for their combustion.

Oxygen of the air is also absorbed by the animals employed in mines, as well as the chemical decomposition of substances found in mines. Whilst under the influence of air and vapor, sulphurets are transformed into sulphates, as in the case of iron pyrites, which are found transformed into sulphates of iron. And it is known that animal and vegetable matters in the same circumstance undergo a fermentation in which the oxygen of the air disappears, the products being dissipated into the surrounding atmosphere. These are chiefly carbonic acid gas, carbonic oxide or white-damp, (?) gaseous compounds of carbon and hydrogen, nitrogen and ammonia, and these gases are combined with other substances, which chemical analysis has been able to isolate. They usually have a sickly odor, and are in the highest degree deleterious to life as miasmata.

The deflagration of powder employed in mines forms a gas and forms a composition of carbonic acid, carbonic oxide, nitrogen vapor of water, carburetted hydrogen, and a little sulphuretted hydrogen. The solid products of the deflagration, which are composed of unburnt powder, sulphate of potash and sulphuret of potassium, are projected in minute particles into the surrounding air, which is obscured by them. The fumes of powder, blasting powder especially, are disagreeable and powerfully irritate the organ of respiration; consequently it is necessary to expel them by the renewal of fresh air where blasting has taken place.

The gases met with in mines which, when sufficiently diluted with atmospheric air, are productive of deleterious effect upon the workmen, or capable of forming, with it, an explosive compound, are as follows:

1. Carbonic acid, called black-damp.
2. Dicarburet of hydrogen, or light carburetted hydrogen, fire-damp; mixed occasionally with carburet of hydrogen, or heavy carburetted hydrogen, or olefiant gas, according to many authorities.
3. Sulphuretted hydrogen, rarely.
4. Carbonic oxide—white-damp.

1. *Carbonic acid* consists of two atoms of oxygen and one atom of carbon. Its specific gravity, compared with air, is 1.52901; the weight of a cubic foot is 0.123433 pounds avoirdupois (Regnault.) Water absorbs nearly its own volume of this gas. Caustic, alkalies and alkaline earths absorb it readily. It will not support combustion. Atmospheric air, mixed with one-tenth of this gas, becomes unfit for combustion, and lights will burn badly in an atmosphere containing five to six per cent. of this gas. Eight per cent. of carbonic acid gas is dangerous to respire. It acts like poison, and to prevent its effects being fatal persons asphyxiated (suspended animation) by this gas should remain in it for a short time. When they recover they find themselves subjected to attacks of severe headaches for some time. Carbonic acid is discharged from fissures and cavities in the strata, and is found to result from respiration, decomposition and deflagration of powder. From its great specific gravity it has a tendency to accumulate in low situations, notwithstanding the tendency of gases mingling with each other, when contained in isolated places.

2. *Dicarburet or hydrogen* is composed of one atom of carbon and two atoms of hydrogen. Its specific gravity is 0.5619, and the weight of a cubic foot is 0.045361 pounds avoirdupois. It is insoluble in water, and is not absorbed by alkalies. When mixed with amospheric air in the proportion of 1-30th to 1-15th of the volume the flame of the candle, when plunged into it, is elongated as the proportion of the inflammable gas approaches 1-15th of the volume. The flame of the wick is surrounded by a halo of pale blue, which is most perceptible towards the point. The combustion only takes place around the wick, and does not extend to the surrounding mass. When the fire-damp forms the 1-14th of the total volume the inflammation extends throughout the whole æriform mass, but without loud detonations. The rapidity of the inflammation increases with the proportion of inflammable gas until it amounts to 1-10th or 1-8th of the total volume. In these latter proportions the mixture is explosive in the highest degree. If the proportions of fire-damp are increased still further the mixture becomes less explosive; and when the mixture contains one-third of its volume of gas it is no longer explosive, but any flame immersed in it is, on the contrary, extinguished by it.

The contact of iron at a red heat is not sufficient to produce the inflammation of fire-damp mixed with air; the presence of flame only is necessary to explode it.

Nitrogen, or carbonic acid, added even to an explosive mixture in small proportions, weakens or even prevents an explosion. One-seventh of carbonic acid added to a mixture the most explosive, is sufficient to render it harmless.

We have, however, from observations on these gases, formed the opinion that certain mixtures of fire-damp and air, rendered inexplosive by the admixtures of carbonic acid, may, under certain conditions, be again rendered explosive by a further addition of fresh air; the carbonic acid which formed one-seventh in bulk of the most explosive compound, forming still proportion of the still explosive compound of the fire-damp with the additional quantity of air.

Dicarburet of hydrogen mixed with air, can be respired for some time without danger, so long as it constitutes less than one-third part of the whole volume; beyond this proportion it causes asphyxia by insufficiency of oxygen.

Light carburetted hydrogen is disengaged from stagnant waters and mud in the form of bubbles, and may be easily obtained from this source. In some localities fire-damp flows out from fissures of the soil; in many places causes natural fires; borings for rock salt often gives off jets of this gas. But it is principally found in coal mines, escaping from the seams of this mineral with a hissing noise analogous to that produced by water when at the boiling point. It is largely produced in faulty places where the texture of the coal has been changed, and also in coal beds, in cavities where it is pent up until the pressure has been reduced, when it rushes out with considerable force.

According to Sir H. T. de la Biche and Dr. Lyon Playfair (Report on gases and explosions, 1846) the analysis of fire-damp obtained from coal mines of the north of England, presented the following results:

Constituent parts.	Walsend from pipe on surface	Walsend, Bensham seam	Jarrow, Benshan sm.	Hebburn, Bensham seam	Jarrow, Low Mean seam	Gateshead, Oakwell gate, five-quarter seam	Jarrow, five-quarter seam	Coal 24 feet below Benshan se'm, Hebburn
Decarburet of hydrogen	92.8	77.5	83.1	86.	79.7	98.2	93.4	92.7
Nitrogen	6.9	26.1	14.2	12.3	14.3	1.3	4.9	6.4
Oxygen			.6		3.0			
Carbonic acid	.3	1.3	2.1	1.7	2.0	.5	1.7	.9
Hydrogen					3.0			
Total	100.0	104.9	100.0	100.0	102.0	100.0	100.0	100.0

The general result of these examinations is that the only inflammable constituent present was dicarburet of hydrogen as an explosive mixture, not a trace of olefiant gas, and only in one of the eight gases analyzed is there any hydrogen.

In connection with this it is necessary to make some remarks upon the carburet of hydrogen or olefiant gas, one atom of which is composed of two atoms of carbon and two atoms of hydrogen. Its specific gravity is .98528, and the weight of a cubic foot is .079540 lbs. avoirdupois; it burns with a red flame of which the illuminating power is much greater than that of dicarburet of hydrogen. A considerable quantity of this gas is obtained from coal by distillation, (or street gas,) as from analysis by Dr. Henry:

No.	CONSTITUENTS IN VOLUME.				
	Specific gravity	Olefiant gas.	Fire-damp.	Carbonic oxide.	Hydrogen.
1	.620	12	64.53	7.33	15.84
2	.630	12	57.40	13.35	17.16
3	.500	7	55.80	13.95	23.25

Common gas, from its mixture with olefiant and hydrogen gases, is much more inflammable than fire-damp, being easily ignited by iron at a low red heat. M. Bishoff, chemist of Bonn, concludes that the inflammable gases of coal mines are mixtures, in different proportions, according to locality, of fire-damp, olefiant gas, and also of other gases in small quantities. He has not been able to detect olefiant gas in the mines of Gerhart & Wellesweiler, in the coal basin of Saarbruck. It is not the same with the inflammable gas produced in the coal basin of Schaumburg, in the coal formation of the Lias. Here the absorption of chlorine mixed with the gas was considerable, and the endosmometric analysis indicated not less than 16 per cent. of olefiant gas, 79 per cent. of fire-damp, and 4.79 of other gases. The wire-gauze used in the mines of Saarbruck requires to be much finer in its texture than that used in the mines of Schaumburg. The actual constituents of the above three gases were as follows:

Localities.	Olefiant gas	Fire-damp.	Probably nitrogen.
Gerhard	1.98	83.08	14.94
Wellesweiller	6.32	91.36	2.32
Schaumburg	16.11	79.10	4.79

Memoire sur L'Aerage des mines, M. Gustav Bischoff. Recueil de memoires et de rapports publie par L'Academie Royale des Sciences et Belles Lettres de Bruxelles, 1840.

Particular experiments have been instituted by Professor Graham on this subject, from which the following is an extract: "*Mining Journal*, June 13, 1846.

Killingworth gas: specific gravity	.6306
Dicarburet of hydrogen	82.05
Nitrogen	16.5
Oxygen	1.0
	100

This, coupled with the results arrived at by Sir H. de le Beche, Dr. Lyon Playfair, Turner, Sir H. Davy and several other skilled analysts, must be considered conclusive upon this point as regards fire-damp of coal mines yet experimented upon. The question, however, should not be considered as finally settled, but should be left open for further trials.

3. *Sulphuretted hydrogen:*—This gas is characterized by the odor of rotten eggs. Its constituents are 1 atom of sulphur, and 1 atom of hydrogen. Its specific gravity is 1.177, and the weight of a cubic foot is 0.0950168 lbs. avoirdupois. Water is capable of absorbing 3 times its volume of this gas. Alkaline solutions absorb it rapidly; chlorine decomposes it by combining with the hydrogen, and causes a deposit of sulphur. Mixed with air, it takes fire at the approach of a flame; the products of the combustion being water and sulphurous acid.

When present, even in small quantities, in gaseous mixtures, it blackens the white oxides of lead and bismuth, which enables us easily to detect its existence. It is sufficient to expose to the mixture in which it is contained, slips of paper which have been dipped in a solution of acetate of lead, and allowed to dry.

It exercises a very deleterious influence on animal life in the highest degree. A bird perishes in air containing 1.1500th part of its volume of this gas; 1.1800th part is sufficient to kill a large dog, and 1.2500th part will destroy a horse. However, in its application to man, its results seems to be somewhat exaggerated. M. Pareut Duchatelet observes, that workingmen respired, with freedom, in air containing 1.100th parts of sulphuretted hydrogen, and that he, himself, respired in air containing 3 per cent.

This gas is formed whenever sulphur, in a very commnnicated form, is brought into contact with hydrogen in a nascent state. Thus it may form in mines where there is a decomposition of iron pyrites, and is also found in old colliery workings, but in rare caser.

4. *Carbonic oxides:*—This gas consists of 1 atom of oxygen and 1 atom of carbon. Its specific gravity is 0.9762, and the weight of a cubic foot is 0.07880 lbs.

Carbonic oxide takes a more deleterious effect upon animal economy than does carbonic acid gas.

It burns with a beautiful light blue flame, but gives little light. When mixed with common air it will not explode like fire-damp, but burns brilliantly. A light can burn brightly, but human life will quickly become extinct. Opinions exist that from instances of this nature some fatal accidents have occurred.

From the properties of the gases above described (excepting carbonic oxide) we may penetrate without danger into any atmosphere which we find to possess no disagreeable odor, which will not blacken acetate of lead, and in which a safety lamp will burn with facility. Even under these conditions the atmosphere may, from the presence of carbonic oxide, be rendered dangerous, and this should lead us to the most practical conclusion, viz: That it is our bounden duty, under all circumstances, to be accompanied by a sufficient current of fresh air in our explorations and excavations in mines.

NATURAL VENTILATION OF MINES.

Ventilation of coal mines consists of sundry applications and under different heads, viz: Natural ventilation consists of making the lowest surface opening the in-take, whilst the most elevated opening is used as an outlet; the temperature of the mine atmosphere being the only medium to give circulation to the volume in its passage outward. By the appliances of wind-gates and wining sheets the air current can be directed on its passage into the working places, and from the increase of temperature its expansion depends, which increases its buoyancy and motion, causing a natural current. This sort of ventilation is greatly accelerated in winter, owing to the outside atmosphere being much colder than in summer. The cold air, having more vapor in its volume, affects the carburetted hydrogen to such an extent that in cold weather very few explosions occur, except in rare cases where negligence is exhibited.

In deep mines, where the temperature of the mine is at all seasons of the year greater than the outer temperature, the ventilation may continue uninterrupted throughout the year, but however effective it may be in collieries where gases and noxious vapors are generated, this sort of ventilation is inadequate for health and safety of workingmen.

The feeble reliance that may be placed on atmospheric changes but increases the chances of danger to life and property. Therefore, it is more prudent to substitute artificial ventilation, it being more reliable and safe, and leads to conceiving a more comprehensive view of the true subject with a view to ultimate success.

WATER-FALL VENTILATION.

This mode of ventilation has received considerable attention, and has been largely practiced in England, especially in Wales. To create a circulation of air in a mine the water is let fall down the downcast shaft, but if the water has no adit or outlet to pass out by, it is expensive to have it raised by pumps for further utility. Yet it is an important method for ventilation, and particularly in cases of explosions or accidents to furnace or fan ventilating apparatus while undergoing repairs, or when shafts may by accident get on fire; then its merits become very important.

The effect of a water-fall experimented at Blackboy mine in 1845: The mine was ventilated by a nine feet furnace. The experiment was made in a working district previous to and after sub-dividing the portion of air applied for its ventilation.

1. Before splitting the air:

The quantity passed in with the furnace working was.....	8.394	per minute.
The quantity passed after putting on the water-fall was.....	11.565	"
Increase due to the water-fall was	3.171	"

2. After splitting the air:

The quantity passed into the district alone was	11.313	"
After putting on the water-fall it was.....	13.687	"
Increase due to water-fall.....	2,374	"

Resistance reduced the increase.

Ventilation in mines produced by a water-fall produces a dampness in the air near the shaft bottom which soon destroys the timbers.

Furnace system has been in use in England and Belgium until lately. Some persons adopt furnace ventilation by using it near or at the surface, whilst others locate it within the mine. The surface furnace is but a poor substitute for ventilation, because the air does not receive any higher temperature until it strikes the fire, where it suddenly is increased in temperature, and consequently expands, which increases the draft, and then but only feebly, whilst a furnace placed deep in the mine, not only heats the air in the furnace, but heats the whole column of air in the upcast shaft.

The effect of a furnace in creating a current in a mine, arises from the expansion and lessening the density of the volume of air in the upcast air course, by the increased temperature imparted to it, over the air supplyed by the downcast, the heated air becomes lighter, and therefore reduces the unit of pressure, destroys the balance of pressure, and creates a draft so long as the heat is continued in the upcast. This current causes a circulation of air throughout the whole mine, when artificially conducted into each working place, removing any deleterious air, and supplying fresh air to the workingmen.

Now, since air expands with every additional degree of (Fahrenheit scale) 1.459ths parts of its volume at zero, or at 32° below the temperature of melting ice, the mode of finding the height of the head of the motive column of air of the same density as the air descending the downcast shaft, is thus expressed by

$$H=D\frac{T-t}{(459+T)}=(1)$$

Where H=head of the motive column in feet.
D=depth of the shaft in feet.
T=average temperature of air in the upcast shaft.
t=temperature of air in the downcast shaft.
459=the constant number already mentioned—results of the best experiments known.—*Magnus and Regnault.*

Air currents meet with resistance as they come in contact with stationary bodies; impede the velocity of the current. This resistance is compared with the force of gravitation, height H, and consequently be expressed by

$$v''=\sqrt{64\frac{1}{4}H} \text{ in feet per second}=(2)$$

Which is the same as $v''=8.0208\sqrt{H}=(3)$

But if the velocity were (in the absence of friction) to be taken in feet per minute=v', then by

$$v'=\sqrt{231.600H}=(4)$$

Or, in another form, by

$$v'=481.2\sqrt{H}=(5)$$

Now the weight of a cubic foot of air is deduced from Regnault's able and delicate experiments, in this latitude, and at sea level is expressed by

$$(W^{\circ}=\frac{(1.32529B)}{459+t}\times\frac{(7000+100}{1728}=(6)$$

Or by its equivalent, viz:

$$W^{\circ}=\frac{536.865B}{459+t}=(7)$$

Where W=the weight in pounds of a cubic foot of air at the pressure B, (expressed in inches of the density due to the temperature of 32° on Fahrenheit scale, being that of melting ice,) the pound being avoirdupois=to 7,000 grains.

W=the weight in grains of 100 cubic inches of dry air.
B=barometrical pressure as exists.
t=the temperature of the air causing the motive power.

Hence, in order to find the pressure in pounds or grains on each square foot, operating to produce ventilation, we may proceed as follows:

1*st*. Find the weight of the column H by formula (1.)

2*d*. Find the value of W by using formula (6.)

3*d*. Multiply the so found value of H by that of W, and the result is the pressure per superficial square foot in pounds, operating to produce ventilation, which being denominated P, gives—

$$P = H w \ldots\ldots (8.)$$

Notwithstanding what has been said, it is somewhat peculiar (judging from the resistance and the pressure necessary to overcome the due velocity) that the action of the passage of air is quite different to that of water, and that in computing the correct amount of ventilation, it is neceesary to carefully allow with due regard to the condition of the air just measured.

In splitting the air two points require particular attention:

1*st*. Not to carry the splitting too far, or the separate currents will become feeble, notwithstanding the increase produced by their means in the total quantity of air passed in a given time.

2*d*. To use large air-ways to where the air is split, and again at where the split currents meet, and continued onward to the surface outcast shaft, and should vary with their circumstantial conditions. Any district air where fire-damp is evolved. that split of air should be carried carefully into the upcast shaft. and not suffered to unite with the splits that are free of gas, as in such a condition the volume increased by this connection that the whole would reach the explosive point.

The necessary quantum of air may be easily conveyed in splits in proper proportions, and conducted away to safe airways without danger. Energetic ventilation is necessary in all collieries that generate gas, consequently great skill and industry is necessary to confine the vitiate air into safe channels on its outward course.

Pennsylvania's Public Works—What the State has Accomplished.

MAIN LINE.	Miles in length.	Cost of improvements
Columbia railroad, Phjladelphia to Columbia	81.00	$5,227,278
Eastern Division of canals, Columbia to Duncan's island	46.00	1,737,285
Juniata Division of canals, Duncannon to Hollidaysburg	127.00	3,575,966
Allegheny Portage railroad, Hollidaysburg to Johnstown	41.00	2,708,672
Western Division of canals, Johnstown to Allegheny city	104.00	3,173,432
Total	399.00	16,422,633
LATERAL LINES.		
Erie extension of canals, including the Beaver division, Shenango and Conneaut lines, French Creek division and Franklin line	163.00	$4,533,291
Susquehanna Division of canal	41.00	897,160
West Branch canal, Northumberland, Farrandsville, etc	80.50	1,833,183
North Branch canal to Lackawanna creek	72.50	1,623,117
Upper North Branch canal to York State	94.25	5,643,491
Wiconisco canal to Duncan's island	12.25	393,440
Delaware Division, Easton to Bristol	60.00	1,543,763
Total	523.50	16,467,445
Total of transferred works to corporations	922.50	32,890,078

CORPORATED RAILROADS.			Miles in Pennsylvania	Branch of or leased to.
Allegheny Valley	Pittsburg	Oil City	132	
Arnot Branch	Blossburg	Arnot	4	Tioga railroad.
Atlantic and Great Western	Salamanca	Dayton, Ohio	94.50	Pennsylvania railroad.
Bald Eagle Valley	Intersection	Lock Haven	51.20	Pennsylvania railroad.
Barclay	Towanda	Barclay	16	Erie railroad.
Beaver Meadow	Penn Haven	Audenreid	17.50	Lehigh Valley railroad.
Belfontain Branch	Millersburg	Bellefonte	2.50	Bald Eagle Valley railroad.
Bellefonte and Snow Shoe	Snow Shoe inter	Snow Shoe	17.25	
Broad Ford and Mt. Pleasant	Broad Ford	Mount Pleasant	9.50	Pitts. and Conn'e railroad.
Buffalo, Bradford and Pittsburg	Carlton, N. Y.	Gilesville	18.50	Erie railroad.
Buffalo, Corry and Pittsburg	Corry	Brocton, N. Y	6	
Butler Extension	Butler Junction	Butler	20.90	Pennsylvania railroad.
Catasaqua and Foglesville	Catasaqua	Rittenhouse	20	
Catawissa	Williamsport	East Mahanoy Junction		Phila. and Reading railroad.
Chartiers	Mansfield	Washington	22.80	Pitts. Cin. & St. L. railroad.
Chester Creek	Lamokin	West Chester Junction	7.25	Pitts. & Balt. Cen. railroad.
Chester Valley	Bridgeport	Downingtown	21.50	Phila. and Reading railroad.
Chestnut Hill	Germantown	Chestnut Hill	4.12	P., G. and N. railroad.
Cleveland and Pittsburg	Rochester	Ohio State line	15	
Colebrookdale	Pottstown	Mount Pleasant	12.80	Phila. and Reading railroad.
Columbia Branch	Dillersville	Branch Intersection	29	Pennsylvania railroad.
Connecting	Pennsylvania railroad	Philad'a & Trenton railroad	6.78	Phila. and Trenton railroad.
Cornwall	Cornwall mines	Lebanon	7	Coal and Iron railroad.
Cumberland Valley	Harrisburg	Hagerstown	68	
Danville, Hazleton and Wilkesbarre	Sunbury	Hazleton	51	
Darby Improvement	Gray's Ferry, Phiadelphia	Ridley	9.6	P., W. and B. railroad.
Delaware and Hudson	Scranton	Honesdale	32	
Delaware, Lackawanna and Western	New York State line	Delaware river	113	
Doylestown Branch	Lansdale	Doylestown	10.3	North Penn'a railroad.
Dunkirk, Warren and Pittsburg	Warren	Dunkirk, N. Y.	13	
East Brandywine and Waynesburg	Downingtown	Waynesburg	17.5	Pennsylvania railroad.
East Mahanoy	East Mahanoy Junction	Waste House run	7.5	Phila. and Reading railroad.
East Pennsylvania	Reading	Allentown	36	Phila. and Reading railroad.
Ebensburg and Cresson	Cresson	Ebensburg	11	Pennsylvania railroad.
Eckley Branch	Lumber Yard	Eckley	3.25	Lehigh Valley railroad.
Elmira and Williamsport	Williamsport	Elmira, N. Y.	69.2	Northern Central railroad.
Erie	Jersey City, N. J.	Dunkirk, N. Y.	42	

CORPORATED RAILROADS.			Miles in Pennsylvania	Branch of or leased to.
Erie and Pittsburg	Girard	New Castle	83.69	Pennsylvania railroad.
Fall Brook	Blossburg	Fall Brook	7	
Farmington Branch	Trexlertown	Farmington	4	Catasauqua&Fogles'lle R. R.
Fayette County	Uniontown	Connellsville	12.66	Phila. and Erie railroad.
Frankford and Holmesburg	Holmesburg Junction	Bustleton	4.15	Phila. and Trenton railroad.
Franklin Branch	Junction	Oil City	33.25	Atlantic and G. W. railroad.
Freemansburg Branch	North Pennsylvania	Freemansburg	1.8	North Penn'a railroad.
Germantown Branch	Intersection	Germantown	3	Phila. G. and N. railroad.
Hanover Branch	Hanover	Hanover Junction	12.20	
Hawley Branch	Hawley	Lackawaxen	15.87	
Hazleton Branch	Hazle Creek Br'g	Hazleton	8	
Hollidaysburg Branch	Altoona	Hollidaysburg	7.8	Pennsylvania railroad.
Hollidaysburg Cove Branch	Hollidaysburg	M'Kees	7.5	Pennsylvania railroad.
Honesdale Branch	Hawley	Honesdale	9	Erie railroad.
Hubbard Branch	Sharon	Youngstown, O	1.41	Erie railroad.
Huntingdon and Broad Top	Huntingdon	Mt. Dallas	41	
Indiana Branch	Blairsville	Indiana	19	Pennsylvania railroad
Ironton	Copley	Orrville	10	
Ithica and Athens	Junction	Ithica, N. Y.	2.6	
Jamestown and Franklin	Oil City	Jamestown	51.1	L. S. & M. S. railroad.
Jeddo Branch	Tunnel	Jeddo	2.50	Lehigh Valley railroad.
Jefferson Branch	Carbondale	Junction	36.50	Erie railroad.
Junction	Belmont	Gray's Ferry	4.62	
Lackawanna and Bloomsburg	Scranton	Northumberland	80	
Lake Shore and Michigan Southern	Buffalo, N. Y.	Chicago, Ill.	44.03	
Lancaster Branch	Junction	Lancaster	8	Reading and Col. railroad.
Lawrence	Lawrence Junction	Youngstown, O.	44	Phila. and Reading railroad.
Lebanon and Tremont	Lebanon	Brookside	44	Phila. and Reading railroad.
Lebanon Valley	Reading	Harrisburg	54	Phila. and Reading railroad.
Lehigh and Lackawanna	Bethlehem	Chapman's	14.50	Lehigh and Susq. railroad.
Lehigh and Susquehanna	Phillipsburg, N. J	Green Ridge	120.50	L. C. and Nav. railroad.
Lehigh Valley	Phillipsburg, N. J	Wilkesbarre	100.75	
Lewisburg, Centre and Spruce Creek	Lewisburg Junction	Mifflinburg	9.38	Phila. and Erie railroad.
Little Saw Mill Run	Banksville	Ohio River	3	Coal railroad.
Little Schuylkill	Port Clinton	E. Mahanoy Junction	25.50	Phila. and Reading railroad.
Littlestown	Hanover	Littlestown	7.25	Hanover Branch railroad.
Lorberry Creek Branch	Lorberry Junction	Lorberry	17	Phila. and Reading railroad.

Mahanoy	Black Creek Junction	Mount Carmel	41	Lehigh Valley railroad.
Mahanoy and Shamokin	St. Nicholas	Herndon	44.50	Phila. and Reading railroad.
Mauch Chunk and Summit Hill	Mauch Chunk	Summit Hill	8	
Mercersburg Branch	Mercersburg	Mercersburg	2.50	South Penna. railroad.
Mifflin and Centre	Lewistown Station	Milroy	12.50	Pennsylvania railroad.
Mill Creek and Mine Hill	Palo Alto	New Castle	3.80	Phila. and Reading railroad.
Mine Hill and Schuylkill Haven	Schuylkill Haven	Locust Gap	28.26	Phila. and Reading railroad.
Mount Carbon	Mount Carbon	Mine Hill	7	Phila. and Reading railroad.
Mount Carbon and Port Carbon	Mount Carbon	Port Carbon	2.50	Phila. and Reading railroad.
Nanticoke Branch	Nanticoke	Newport	20	Lehigh and Susq'a railroad.
Nescopec Branch	White Haven	Upper Lehigh	9	Lehigh and Susq'a railroad.
Nesquehoning Valley	Nesquehoning Junction	Tamanend	16.50	Lehigh and Susq'a railroad.
New Castle and Beaver Valley	New Castle	Home Wood	14.92	P'g, Ft. W. & Chi. railroad.
Newry	Duncansville	Newry	1.10	Pennsylvania railroad.
Northern Central	Baltimore, Md.	Sunbury	102	
Northern Liberty and Penn Township	Philadelphia	Philadelphia	1.40	Phila. and Reading railroad.
North Pennsylvania	Philadelphia	Bethlehem	55.60	
Oil Creek and Allegheny	Corry	Irvineton	95	
Pennsylvania	Philadelphia	Pittsburg	354.90	
Pennsylvania Coal Company	Hawley	Port Griffith	47	Empty car track.
Pennsylvania Coal Company	Port Griffith	Hawley	47	Loaded car track.
Pennsylvania and New York	Wilkesbarre	Waverly, N. Y.	104.50	Lehigh Valley railroad.
Perkiomen	Perkiomen	Schurnksville	11	Phila. and Reading railroad.
Philadelphia and Baltimore	West Chester Junction	Port Deposit, Md.	36.50	
Philadelphia and Erie	Sunbury	Erie	287.6	Pennsylvania railroad.
Philadelphia and Germantown	Philadelphia	Norristown	17	Phila. and Reading railroad.
Philadelphia and Reading	Philadelphia	Pottsville	93	Phila. and Reading railroad.
Philadelphia and Trenton	Philadelphia	Morrisville	26.50	
Philadelphia and Wilmington	Philadelphia	Baltimore, Md.	18.21	
Pit-Hole Valley	Pit-Hole City	Oleopolis	7	
Pittsburg, Cincinnati and St. Louis	Pittsburg	Columbus, O.	35.25	
Pittsburg and Connellsville	Pittsburg	Cumberland, Md.	60	
Pittsburg, Fort Wayne and Chicago	Pittsburg	Chicago, Ill.	49	Pennsylvania railroad.
Plymouth	Conshohocken	Oreland	9.25	Phila., G. and N. railroad.
Fort Kennedy Branch	Port Kennedy	Quarries	1.20	Phila. and Reading railroad.
Reading and Columbia	Columbia	Sinking Springs	40	
Schuylkill and Susquehanna	Auburn	Rockville	54	Phila. and Reading railroad.
Schuylkill Valley	Port Carbon	Reesedale	11	Phila. and Reading railroad.
Shamokin Valley and Pottsville	Sunbury	Mt. Carmel	28	Northern Central railroad.
Shoup's Run Branch	Saxton	Dudley	6	Hunt'n and B. Top railroad.
Shenango and Allegheny	Shenang	Pardoes	20	Hunt'n and B. Top railroad.
Six Mile Run Branch	Riddlesburg	Coal mines	4.50	Hunt'n and B. Top railroad.
Somerset and Mineral Point	Mineral Point	Somerset	8.75	Pittsb'g & Con'lle railroad.

Pennsylvania Public Works—*Continued.*

CORPORATED RAILROADS.			Miles in Pennsylvania	Branch of or leased to.
Southern Pennsylvania	S. Pennsylvania Junction	Richmond	24	Cumberland Valley railroad.
South Mountain	Carlisle	Pinegrove	18	P., W. and B. railroad.
Southwark	P. W. and B. R. R., Phila	Delaware river	2.12	P., W. and B. railroad.
Steubenville extension	Pittsburg	Birmingham	1.20	Pennsylvania railroad.
Strasburg	Leaman place	Strasburg	4.75	
Sullivan and Erie	Monroeton	Bernice	24	
Summit Branch	Millersburg	Williamstown	20	
Sunbury and Lewistown	Lewistown	Junction, N. C. railroad	44	
Susquehanna, Gettysburg and Potomac,	Hanover	Gettysburg	16.16	Hanover Branch railroad.
Tioga	Morris Rnn	Lawrenceville	30.6	
Tremont Branch	West Wood	Tremont	9.21	M. H. and S. H. railroad.
Tresckow	Silver Brook	Audeureid	6	Idle.
Tyrone Branch	Tyrone	Intersection	3.1	Pennsylvania railroad.
Tyrone and Clearfield	Intersection	Clearfield	37.50	Pennsylvania railroad.
Union and Titusville	Union	Titusville	25	
West Chester	West Chester intersection	West Chester	9.7	W. Chester & Phila. railroad.
West Chester and Philadelphia	Philadelphia	West Chester	26.3	
West Pennsylvania	Blairsville	Allegheny city	63.7	Pennsylvania railroad.
West Reading Branch	Reading	West Reading	1.7	Phila. and Reading railroad.
Wheeling, Pittsburg and Baltimore	Washington	Wheeling, West Virginia	16	Baltimore and Ohio railroad.
Wilmington and Reading	Birdsboro'	Wilmington, Delaware	51.7	
Wrightsville, York and Gettysburg	York	Wrightsville	13	Pennsylvania railroad.

141 railroads within the State, 4,382.49 miles.

Canals in Pennsylvania.

Name.	From.	To.	Length.	Remarks.
Delaware and Hudson	Honesdale	Eddysville	25	
Delaware Division	Easton	Bristol	60	
Erie and Pennsylvania	Erie	Beaver	136	Lehigh coal and nav. com'y.
French Creek feeder	Bemus dam	Main canal	25	Branch of Erie canal.
Junction	State line	Elmira, New York	3.25	
Lehigh coal and navigation	Easton	Coal Port	48	
Monongahela navigation	Pittsburg	New Geneva	83	
Muncy Branch			.75	
Pennsylvania	Columbia	Hollidaysburg	173	
Pennsylvania	Northumberland	Wilkesbarre	64	
Pennsylvania and New York	Wilkesbarre	New York State line	105	
Schuylkill navigation	Port Carbon	Wire bridge, Philadelphia	108.28	Phila. and Reading railroad.
Susquehanna	Columbia	Havre-de-Grace	30	
Union	Reading	Middletown	77.64	
Feeder Dam	Main canal	Finegan's dam	7	Branch of Union canal.
West Branch and Susquehanna	Junction	Farrandsville	123	Pennsylvania canal.
Bald Eagle cross cut	Lock Haven	Bald Eagle	3	Branch of W. B. and S. canal
Lewisburg cross cut	Main canal	Lewisburg	1	Branch of W. B. and S. canal.
Wiconisco	Millersburg	Clark's ferry	12	

29 canals within the State, 1,885.42 miles.

One hundred and seventy public improvements within the State, making 6,267 91-100 miles, at $24,000 per mile, gives $150,432,000, as an amount of capital for these improvements alone. The equipments and rolling stock of the same may be estimated at $100,000,000, whilst the buildings, lands, salaries, etc., may make up $50,000,000, making an aggregate amount, in round numbers, of

$300,432,000, as a first cost investment.
+ 067,911,708, as investments in colleries.
4,207,789, as value of improvements and materials.
= 372,550,495. To this amount must be added
————, for opening and excavations of collieries.
————, for subsistance, stock and steam power.
————, for iron interest and real estate.

Figures which we have not at hand, and then we have but a remote knowledge of the vastness of her improvements outside these public works.—*Statistics from Pennsylvania Atlas.*

SCHUYLKILL COUNTY RAILROADS IN 1872.—WHAT THE COUNTY HAS ACCOMPLISHED.

Schuylkill county freight lines, operated by the Philadelphia and Reading railroad and other companies.

READING COMPANY'S ROADS.

Its main line, Port Clinton, Pottsville and sidings	35	miles.
Canal sidings	4	"
Little Schuylkill railroad and sidings	54	"
Schuylkill and Susquehanna railroad and sidings	30	"
Pine Grove and Lebanon.....do.....do	6	"
Union, Pine Grove and Lorberry railroad and sidings	4	"
Lorberry.....do.....do	14	"
Good Spring.....do.....do	21¼	"
Mine Hill and Schuylkill Haven....do.....do	138¼	"
Mount Carbon.....do..... do	15	"
Mount Carbon and Port Carbon.....do.....do	14¼	"
Mill Creek.....do.....do	25	"
Schuylkill Valley.....do.....do	34	"
East Mahanoy.....do.....do	13¾	"
Mahanoy and Shamokin.....do..... ....do	67¼	"
Mount Eagle.....do.....do	4	"
Philadelphia and Reading company's railroads	480¼	"
Mauch Chunk gravity road in Schuylkill county	4	"
Beaver Meadow.....do.....do	6	"
Nesquehoning.....do.....do	9¼	"
Lehigh Valley.....do.....do	52	"
Catawissa.....do.....do	25	"
21 railroads for traffic	577	"
Schuylkill county, in gangway tracks in operation	143	"
Schuylkill county, outside tracks in operation	297	"
Total tracks in operation in the county	1,017	"
Pottsville People's street railway	6	"
	1,023	"
Canal	17	"
Total	1,040	"

This exhibit is an endorsement for Schuylkill county, as being the leading county of the State.

REPORT

OF THE

INSPECTOR OF MINES OF THE FIRST, OR POTTSVILLE DISTRICT, FOR 1872.

His Excellency, JOHN F. HARTRANFT,

Governor of the Commonwealth of Pennsylvania:

SIR:—In compliance with the requirements of an act of Assembly approved the third day of March, 1870, entitled "An Act providing for the health and safety of persons employed in the anthracite coal mines of Pennsylvania," I have the honor to herewith submit my annual report of all casualties which occurred in and about the seventy-six (76) collieries of my district during the year, showing their extent and character; the number of maimed persons; the number of widows and orphans; the character and condition of our collieries; the condition and improvement in mines and ventilation; the decrease of mortality and casualties in the district, less than what it was last year, as shown in our annexed death-roll; the steam power used for producing coal at our collieries; the force of hands employed in connection with mining coal, etc.

Your Excellency will be pleased to learn of the visible decline in mortality and the improvement which is taking place in the collieries since the State assumed the right to protect miners and mine workingmen. We are consoled in the consciousness of having discharged our duties faithfully and under trying circumstances, to the best of our ability, for general good.

Although the collieries of my district, "with very few exceptions," generate gases largely, I am pleased to say that that element is nearly under control. No serious disaster need be apprehended in the very worst cases at present. The regulations of the mines and a fit compliance with the requirements of law greatly lessen the dangers of the mines. There are but two collieries that were reluctant to comply with the provisions of law, and these are evincing better industry. There are accidents over which no amount of vigilance has control, but from our experience and practice and investigations of the casualties that do occur, we find ninety-six per cent. of them to arise from the hasty, ignorant and inexperienced acts of the parties themselves. The other four per cent. we charge to irregularities of mine discipline and negligence. Being present at sixteen inquests, and taking the testimony of witnesses in these cases, and my own view of the facts, the juries rendered verdicts of accidental deaths. On the whole, I am pleased to say the law has wrought a wonderful change both in the condition and character of the collieries and people far above expectation. I am not forgetful of the many courtesies I have received from the managers and mine bosses in aiding me to discharge my duties and their conforming with my instructions for the general improvement of the condition of their mines. Particular in this case are Mr. William Kendrick, mining superintendent for Philadelphia and Reading Coal and Iron Company, and Mr. W. Zehner, superintendent for Lehigh Coal and Navigation Company, whose examples are worthy of honorable mention. I trust that others may soon deserve a like approbation.

POTTSVILLE DISTRICT.

A LIST *of names of persons who were killed, or that died of injuries, during the year ending Dec.* 31, *A. D.* 1872.

Months.	Names of the dead.	Location and name of the collieries.	Wife	Children...	Remarks.
February 20,	John D. Jenkins	Mine Hill Gap	1	5	Killed—fell down the slope.
March 23,	J. Brannan, "Hardi,"	Glen Carbon	1	6	Died—injured by falling off the cage.
April 10,	John Murry, (boy,)	Thomaston	.....	.....	Died—burned by an explosion of gas.
" 14,	John R. Davis	Taylorville	.....	.....	Killed in getting on the moving cage.
May 5,	Martin Kelly, (boy,)	Beechwood	.....	.....	Died—burned by an explosion of gas.
" 29,	Thomas Wilson	Pine Forest	1	5	Killed by a fall of coal.
July 12,	Henry Haberly	Raven Dale	1	6	Killed by a fall of coal.
" 24,	John Bell	Thomaston	.....	.....	Killed—being run over by a train of wagons.
August 28,	Michael Haughney, (boy,)	Glen Carbon	....	.....	Killed—fell into the revolving screens.
Sept. 1,	John Walsh	East Pine Knot	1	6	Killed by an explosion of gas.
" 7,	Owen T. Jones	St. Clair shaft	1	4	Died—burned by an explosion of gas.
" 14,	James Roberts	East Mine shafts	1	4	Died—injured by falling down the shaft.
October 17,	Charley Walker	High Mines	.....	.....	Killed by falling down the slope.
" 22,	Richard O. Neil	St. Clair shaft	1	5	Killed by a fall of top slate.
" 23,	Joseph Yust, (boy,)	Eagle	.....	.....	Killed by a fall of top slate.
Nov. 27,	John Quilliam	Eagle Hill	1	.....	Suffocated by after-damp.
Dec. 29,	Henry Williams, (boy,)	Heckscherville	.....	....	Killed—fell down the slope.

17 persons lost their lives in and about the collieries of the district during the year just closed, leaving 9 widows and 41 orphans, showing a decrease in the number of deaths this year of 13 less than that of last year. Such happy results chiefly arise from the better order of things under the direction and instructions of the inspector of coal mines. But by better care on the part of others, the reduction in loss of life would be still greater.

POTTSVILLE OR FIRST DISTRICT.

List of names of persons maimed and injured in and about these mines during the year ending December 31, A. D. 1872.

Date.	Names of injured persons.	Names of the collieries.	Remarks and causes of injuries.
Feb. 16,	Samuel Shane...	Silver Creek.....	Leg broken by a fall of coal.
20,	Job Mitchell.....	Glen Carbon.....	Burnt by an explosion of gas.
Mar. 14,	A miner	Mammoth shaft.	Leg broken by a fall of rocks.
25,	Thomas Johns...	Eagle.....	Severely burnt by gas.
25,	James Blecker...	Eagle.....	Severely burnt by gas.
28,	Jac. A. Goodman	Swift Creek.....	Severely burnt by gas.
28,	Chas. Goodman..	Swift Creek.....	Severely burnt by gas.
Apr. 5,	John Jones.....	Pine Forest.....	Severely burnt by gas.
5,	John Morris.....	Pine Forest.....	Severely burnt by gas.
6,	William Dailey	East Pine Knot...	Thigh broken by a fall of coal.
15,	Thomas Murry..	Thomaston.....	Mortally burnt by gas—died.
15,	John Keller.	Eagle.....	Mortally burnt by powder.
26,	A miner.....	Taylorville.....	Severely burnt by gas.
26,	A miner assist't..	Taylorville.....	Severely burnt by gas.
27,	Martin Kelley ...	Beechwood.....	Mortally burnt by gas—died.
30,	Thos. Leonard...	Tamaqua shaft ...	Severely burnt by gas.
30,	Patr'k M'Corley.	Tamaqua shaft ...	Severely burnt by gas.
May 1,	Patrick Brinnan.	Pine Forest.....	Severely burnt by gas.
10,	Geo. Rothford....	Raven Dale.....	Severely burnt by gas.
10,	Geo. Rothford, jr.	Raven Dale..	Slightly burnt by gas.
12,	Morg. Williams..	Greenwood.....	Severely burnt by gas.
17,	John Tierney.....	Eagle.....	Eyes destroyed by a blast.
18,	J. Prenderghast.	East Pine Knot..	Eyes injured by coal.
18,	George Glenn.....	St. Clair shaft	Severely burnt by gas.
20,	Thos. O. Donnell.	Pine Forest.....	Severely burnt by a blast.
22,	Christ. Yeofert...	Pine Forest.....	Slightly burnt by gas.
22,	James Davis.....	Pine Forest.....	Slightly burnt by gas.
22,	Jno. H. Thomas..	Pine Forest.....	Slightly burnt by gas.
22,	John Morris.	Pine Forest..	Severely burnt by gas.
24,	Alick Anderson..	Beechwood.....	Severely burnt by gas.
24,	Two miners.....	Beechwood.....	Severely burnt by gas.
24,	John Lewis.....	Beechwood.....	Slightly burnt by gas.
29,	W. Wilson, (boy)	Pine Forest...	Severely injured by a fall of coal.
June 8,	Patrick Nevins...	Eagle Hill shaft ..	Severely burnt by gas.
11,	Pat'k Berrigan...	Commercial.....	Arm amputated—crushed by timbers.
July 3,	Larry Egan	Beechwood.....	Severely burnt by gas.
3,	Peter Egan...	Beechwood... ...	Severely burnt by gas.
11,	Thomas Bohan...	Eagle Hill shaft .	Severely burnt by gas.
11,	Luke Haggerty..	Eagle Hill shaft .	Severely burnt by gas.
13,	John Lewis.....	Coal Dale	Hand cut off by a fall of slate.
17,	Joseph Jones.....	St. Clair shaft	Severely burnt by gas.
17,	Daniel Howles...	St. Clair shaft	Severely burnt by gas.
26,	David Oliver.....	Eagle Hill shaft .	Arm broken by fall of a trestle work.
26,	John Williams..	East Mine shafts .	Leg broken by a fall in the shaft.
Aug. 13,	John Thomas.....	Taylorville.....	Severely burned by gas.
13,	William Jones...	Taylorville.....	Severely burned by gas.
22,	George Barns....	Beechwood.....	Foot cut off in the cog wheels.
22,	John Walsh. .	East Pine Knot..	Severely burnt by gas.
22.	Edw'd Murphy.	East Pine Knot...	Severely burnt by gas.
29,	Owen T. Jones..	St. Clair shaft	Mortally burnt by gas—died.
29,	John Murry.....	St. Clair shaft	Leg crushed by wagons.
31,	Daniel Grumm.	St. Clair shaft	Severely burnt by gas
31,	Wm. Roberts.....	St. Clair shaft	Severely burnt by gas.
Sept. 10,	James Roberts...	East Mine shafts .	Mortally injured—fell down the shaft.
16,	W. H. Jones.	Glen Carbon	Severely crushed by wagons.
18,	Allen Watkins...	Spruce Forest.....	Leg cut off in small rollers.
Oct. 2,	Frank Flynn.....	Beechwood.....	Legs broken—fell off the breaker roof.
8,	Edw'd Brophy...	Glen Carbon	Severely injured—fell into a schute.
8,	John Curran.....	East Pine Knot...	Severely injured by a fall of coal.
17,	Owen T. Jones...	St. Clair..	Severely burnt by gas—died.
23,	Thomas Regan...	Raven Dale.....	Severely burnt by gas.
23,	Patrick Murphy.	Raven Dale..	Slightly burnt by gas.
23,	Andrew Tunpus.	Hickory shaft	Severely crushed by wagons.

POTTSVILLE OR FIRST DISTRICT—*Continued.*

Date.	Names of injured persons.	Names of the collieries.	Remarks and causes of injuries.
Oct. 28,	John Flegan.....	Eagle.....	Leg broken by a wagon.....
28,	Griffith Smith ...	Raven Dale.....	Severely injured—fell down a schute.....
29,	Patrick Flynn...	Tuscarora.....	Thigh broken by a fall of coal... .....
31,	F'nk M'Andrew	Beechwood	Scalp wound—injured by a mule.....
Nov. 2,	John Quilliam...	Eagle Hill.....	Dangerously injured—burned by gas.....
Dec. 28,	Henry Botten....	Tunnel No. 10....	Leg and arm broken—crushed by wagons

Sixty-nine persons were maimed and injured during the year; six of which died subsequently from the effects of their injuries.

POTTSVILLE DISTRICT.

COAL TONNAGE FOR THE YEAR 1872 WAS 1,665,804 TONS.

No.	Names of collieries.	Locations.	Names of land owners.	Names of operators.	Shipments.
1...	Butler	Silver Creek	Swayne & Able	Winlack & Co	11,574
2...	Eagle Hill	Eagle Hill	P. R. Coal and Iron company	J. C. Oliver & Co	59,763
3...	Norwegian	Mt. Laffee	P. R. Coal and Iron company.	—— Buckley	Idle.
4...	Glen Carbon	Glen Carbon	P. R. Coal and Iron company.	John Lucas	64,067
5...	Feeder Dam	Mill Creek	P. R. Coal and Iron company.	William Murray	10,539
6...	Commercial	New Philadelphia	P. R. Coal and Iron company.	William Kendrick	9,173
7...	East Mine	East Delaware	P. R. Coal and Iron company.	Fidler & Co	60
8...	St. Clair shaft	St. Clair	P. R. Coal and Iron company.	William Kendrick	73,236
9...	Coaldale	Coaldale	Lehigh Coal and Navigation Co	Lackawanna Coal and Nav. Co	75,000
10...	East Pine Knot	Greenberry valley	P. R. Coal and Iron company.	William Kendrick	46,987
11...	Black Heath	St. Clair	P. R. Coal and Iron company.	A. Jackson	2,138
12...	Manchester	Wadesville	P. R. Coal and Iron company.	Alden & Co	4,359
13...	Spruce Forest	New Castle	G. Richardson	J. Dennings	1,666
14...	Ravensdale	Ravensdale	P. R. Coal and Iron company.	William Starr	54,262
15...	Diamond	Eagle Hill	P. R. Coal and Iron company.	Diamond Coal company	7,560
16...	Ellsworth	New Castle	P. R. Coal and Iron company.	J. R. Davis	286
17...	Mammoth vein	West Castle	P. R. Coal and Iron company.	J. Denninge	317
18...	Bullock	Minersville	Bullock and Brothers	J. H. Thomas	2,078
19...	Glen Dower	Glen Carbon	P. R. Coal and Iron company.	William Kendrick	40,477
20...	Eagle	St. Clair	P. R. Coal and Iron company.	G. W. Johns	70,142
21...	Tamaqua	Tamaqua	P. R. Coal and Iron company.	Mackey & Co	16,834
22...	Forestville & Montana	Forestville	P. R. Coal and Iron company.	D. Hock & Co	15,695 19,601
23...	Monitor	Wadesville	P. R. Coal and Iron company.	Rowland & Co	11,643
24...	Phœnix, No. 4	Phœnix Park	P. R. Coal and Iron company.	J. O. Maley	1,392
25...	Diamond, No. 2	Forestville	P. R. Coal and Iron company.	L. Sutter & Co	2,114
26...	Mammoth shafts	East Mines	P. R. Coal and Iron Co., (sinking,)	P. R. Coal and Iron company	8,113
27...	Hickory slope	St. Clair	P. R. Coal and Iron company.	William Draper & Co	18,113
28...	Mine Hill Gap	Mine Hill Gap	P. R. Coal and Iron company.	William Kendrick	235
29...	Swift Creek	Tuscarora	G. Bast and others	G. Bast & Co	Idle.
30...	Alaska	Tamaqua	P. R. Coal and Iron company.	General Cake	16,753
31...	Wabash	Reevesdale	P. R. Coal and Iron company.	William Kendrick	26,493
32	Reevesdale	Reevesdale	P. R. Coal and Iron company.	William Kendrick	461
33	New Kirk	Reevesdale	P. R. Coal and Iron company.	Shoemaker & Co	35,656
34	Silver Creek	Silver Creek	Swayne & Able	T. Williams	12,968
35	Pine Forest	St. Clair	P. R. Coal and Iron company.	William Kendrick	97,106

No.	Names of collieries.	Locations.	Names of land owners.	Names of operators.	Shipments.
36...	Hickory shaft	Wadesville	P. R. Coal and Iron company.	William Kendrick	78,294
37...	Greenwood	Tamaqua	Lehigh Coal and Navigation Co	E. Borda	88,122
38 .	Greenwood	Tamaqua	Lehigh Coal and Navigation Co	E. Borda	
39..	Beechwood	Mount Laffee	P. R. Coal and Iron company.	William Kendrick	89,649
40...	York	Pottsville	A. Russell & Co.	Llewellyn & Co.	3,000
41...	York Farm	Pottsville	A. Russell & Co.	J. Rich	4,000
42...	Sharp Mountain	Pottsville	Richardson & others	J. S. Wood	7,444
43...	Tamaqua	Tamaqua	P. R. Coal and Iron company.	Mackey & Co.	16,834
44...	Yorkville	Yorkville	Richardson and others	Baltaizer & Co	2,000
45...	Lambert	Combola		S. Morgan	9,810
46...	New Philadelphia	New Philadelphia		Hein & Co	1,048
47..	Thomaston Slope	Thomaston	P. R. Coal and Iron company.	William Kendrick	3,033
48...	Thomaston, New Slope	Thomaston	P. R. Coal and Iron company.	William Kendrick	15,135
49...	Heckscherville	Heckscherville	P. R. Coal and Iron company.	J. Wadlinger	44,804
50..	Anthracite	Tamaqua	P. R. Coal and Iron company.	August Rabb	268
51...	Bull Run	Bull Run	Lehigh Coal and Navigation Co	Lehigh Coal and Navigation Co	80,000
52...	Taylorville	Glen Dower	P. R. Coal and Iron company.	T. Shollenberg	9,088
53...	West Pine Knot	Cool Castle	P. R. Coal and Iron company.	William Kendrick	Idle.
54...	Little Tracy	East Mines	P. R. Coal and Iron company.	C. Conner	200
55...	North America	East Mines	P. R. Coal and Iron company.	William Meade	200
56...	North America, No. 2	East Mines	P. R. Coal and Iron company.	Faust & Brother	300
57...	North America, No. 3	East Mines	P. R. Coal and Iron company.	John Reese	300
58...	Palmer	Minersville	P. R. Coal and Iron company.	J. Wadlinger	125
59...	Tracy Vein	East Mines	P. R. Coal and Iron company.	William Clark	300
60...	East Mine	East Mines	P. R. Coal and Iron company.	G. Seibert	300
61...	Tuscarora	Tuscarora	P. R. Coal and Iron company.	J. Sullivan	198
62...	Kentucky	Tuscarora	Kentucky Bank	Sholl & Donohoe	13,096
63...	Peach Orchard	Tuscarora	Kentucky Bank	R. Rowbotham	4,318
64...	Buckville	Buckville	P. R. Coal and Iron company.	William Kendrick	1,755
65...	Live Oak	Mine Hill Gap	P. R. Coal and Iron company.	William Kendrick	16,334
66...	White Oak	New Castle	P. R. Coal and Iron company.	J. Dennings	440
67..	Oak Dale	Glen Carbon	P. R. Coal and Iron company.	J. Lucas	48,137
68...	Holohan	Oak Hill	P. R. Coal and Iron company.	Holohan & Brother	765
69...	Kaska William	Middleport	P. R. Coal and Iron company.	J. Major	663

70...	Palmer	Coal Hill	P. R. Coal and Iron company.	B. F. Palmer	822
71...	Taggart	New Castle	P. R. Coal and Iron company.	J. Taggert	173
72...	Lanagan	New Castle	P. R. Coal and Iron company.	James Lanagan	249
73...	J. R. Jones	Minersville	P. R. Coal and Iron company.	J. R. Jones	364
74...	Konfer	Minersville	P. R. Coal and Iron company.	Konfer & Kantner	495
				Six others	738
				Abblett and Moss	1,765
				Local consumption	278,334

BUTLER COLLIERY.—*Wenlack & Randal, Operators.*

The Butler Colliery is situated at Silver creek, in Schuylkill county, on the estate of Messrs. Swayne & Co., of the Philadelphia *Public Record*. It consists of a slope sunk 100 yards deep, on the south dip of the E vein, together with some drift workings. These mines have been extensively operated for a number of years by different parties. By a practice of reducing the pillars the slope finally closed, causing a considerable loss to the present firm, who were then engaged in recovering the pillars and coal. They, however, have succeeded in opening the D or Skidmore vein by a tunnel some 58 yards east of the slope, the dividing rock being only —— feet thick. The coal seam is found from 7 to 12 feet thick and of excellent quality. There are east and west gangways opened, with four breasts working in each; the character of work done is considered safe; the west gangway on the present lift is cut off by a ravine; the east gangway has an extensive run.

There being no second outlet for workingmen's escape, it was necessary to have an injunction executed against its further operation in contravention of law until this requirement be complied with, which would make the mining of coal safe and an escape secured for the miners.

In the further working of the mines, I directed the pillars to be made thicker, and stronger propping and timbering to be used. The writ of injunction resulted favorably, since which time matters go on satisfactorily.

The improvements consist of one sixty horse power hoisting and pumping engine, a ten horse breaker engine, with eight steam boilers, the condition of which was not reported to me.

Ventilation is produced by natural means, and is not adequate nor practical, but preparations for erecting a steam fan are in progress, after which ventilation will be effectual. Black and white damps only are generated here.

The present monthly shipment exceeds 2,500 tons.

There are 47 men and 6 boys employed; 4 head of mules and 11 mine wagons are used; the improvements are valued at some $5,000; 700 yards of 25 lbs. T rail is laid on the premises; the appearance and conditions of things are favorable.

EAGLE HILL SHAFT COLLIERY.—*James C. Oliver, Operator.*

This colliery is situated east of Port Carbon, on the present estate of the P.

It consists of a shaft sunk 100 yards deep, from which a tunnel of 20 yards south opens the E vein; east of this point a slope is sunk 140 yards deep on an angle of 25°; the E seam is found here in two benches or split seams; the coal in the top seam is 14 feet and that in the bottom seam 18 feet in thickness, all of which is an excellent quality. The dividing rock strata is from 9 to 40 yards thick. Both these seams are worked east and west, making a lift of 4 distinct gangways; 24 breasts are worked in the mine with schute and heading workings.

Ventilation—the condition of which and means of, was for a long time unsatisfactory. It was found necessary to restrain the further working of the mine by the services of a writ of injunction until proper means and better ventilating channels were established. After some time this difficulty had been overcome to my satisfaction. A steam fan is at present in operation which is capable of producing a full supply of ventilation to render the mine safe for the workingmen from explosions of fire-damp. I found 107 persons employed in the mine, each requiring 66 cubic feet of pure air per minute; the 107 lights required 792 cubic feet of air per minute to sustain them, and 6 mules required 2,376 cubic feet of air per minute to sustain them; the whole needed supply of air required was 10,230 cubic feet, while no allowance had been made for defects, &c., and the actual supply found to be produced by careful measurement was only 5,040 cubic feet of air, the velocity of which being 120 feet per minute, and the section area of the opening being 42 square feet. The temperature outside of the mine was 78° F. and inside it was 74° F., whilst the Aneroid barometer indicated outside 28¼ inches and inside was 29 inches.

Engines.—There are 5 steam engines equal to 196 horse power, and a new 20 horse steam fan; 14 steam boilers in use, whose condition is not reported upon; 197 hands are employed; 8 mules and 38 mine wagons are used; 3,000 yards of 28 lbs. T rail are in use. The valuation of the improvements is estimated at $80,000.

It is proper to state that a manifest desire on part of the operator to comply with the requirements of law is daily apparent, whilst under the operation of the new steam fan and the proper distribution of fresh air, good ventilation will be permanently secured, and the dangers of mine accidents be largely reduced.

Such collieries as are well ventilated, and where proper discipline has been enforced and obeyed, the casualties are greatly decreased in comparison to such collieries as are not under proper stringent regulations, as will be noticed in tables on accidents in this report, which gives the names of the collieries and number of accidents in each. Total number of casualties at the Eagle Hill Shaft Colliery during the year—1 person died of injuries; 7 persons were injured; 8 visits had been made, equal to 64 miles traveled. The general condition of the colliery is rapidly improving.

NORWEGIAN COLLIERY.—*Messrs. Schweers and Brown, Operators.*

This colliery is situated near Mount Laffy, on the estate of the Philadelphia and Reading railroad. The mines have been worked for 38 years. It consists of 3 slope and 1 shaft opening; all of which, of late, have been idle. The new slope had been sunk 100 yards deep on the south dip of the Primrose or G seam; the coal is 10 feet thick; the seam dips on an angle of 70°. The south dip is opened by an incline plane, started 450 yards from the slope; 2 gangways are worked east and west, with 17 breasts open on this counter. In June a crush nearly closed the old gangway, and most part of the counter gangways; the other, red ash slope working, had been filled with water, which threatened the destruction of the counter workings, should the breast workings be advanced; this imperiled the lives of the workingmen. In view of this apparent danger, I directed a process of injunction to be issued to restrain the further working of these breasts in that dangerous direction, as indicated by careful surveys made of the locality. And further, there had been no second out-let for egress and ingress to escape by. This improvement would, necessarily, involve an expenditure which the operators were reluctant to bear, and they finally concluded to close the works. This step, perhaps, saved the lives of a number of workmen. Ventilation was produced by a steam fan, but was not adequate to furnish a proper supply of air for the men, owing to its improper distribution. The mines generated fire-damp largely, which rendered the operation of the miner a perilous undertaking.

Improvements.—There are 5 steam engines, equal to 290 horse power, 13 steam boilers, 23 wagons, 8 mules in use, and 12 blocks of houses, with 19 families.—Value of improvements is about $50,000. Sixty inside hands, and 22 outside hands, were employed. Outside temperature 76°, and inside 78°. Barometer outside was 28 7-10, and inside 28 inches. Monthly shipments of coal was some 3,500 tons. One thousand yards of T rail has been used.

GLEN CARBON COLLIERY.—*John Lucas & Co., Operators.*

The colliery is situated at Glen Carbon, on the present estate of the Philadelphia and Reading railroad company. It consists of a slope opening, sunk 200 yards deep on the south dip of the Crosby vein, on an angle of 66°; the Church vein is also worked by this slope. There are 4 gangways in use; a partition rock 45 yards thick separates these two coal veins; the coal of which is from 7 to 18 feet thick. Eighty-six yards of a tunnel opens the Daniel vein, which lies north of the Crosby vein. The mines are divided into 4 working panels. The character of work done is considered a safe operation.

Ventilation is produced by the operation of a 40-horse power steam fan; each panel is ventilated by a separate spit of air. There are 100 hands employed inside, and 100 hands employed outside; 12 breasts, with schutes and headings, are working. Ventilation is found to be excellent.

Engines.—There are 7 steam engines—290-horse hoisting engine, a 40-horse fan, a 290-horse pumping engine, a 40-horse steam pump, a 50-horse breaker engine, a 30-horse feed pump=630 horse steam power, with 16 steam boilers, the condition of which is reported to me to be good. I recommended a change in the mode of

conducting the air into and out of the working places, which would largely contribute to furnish a good supply to the workingmen, as fire-damp is generated largely in this colliery.

Outside temperature —, inside temperature —; outside barometer —, inside barometer —. The supply of air found, by measurement, was —— cubic feet per minute for 100 hands, 110 lights and 8 mules.

Valuation of improvements is estimated at $————; there are —— houses, with —— families; —— wagons and 12 mules in use. Monthly shipments ——— tons.

FEEDER DAM COLLIERY.—*William Murray, Operator.*

The Feeder Dam colliery is situated north of Port Carbon, upon the estate of the North America company. It consists of a slope sunk in two lifts, some 200 yards deep, on the south dip of the Diamond or J seam, on an angle of 26° dip. The character of work being done is driving gangway and breast working. An inclined plane opens a counter-gangway 500 yards east of the slope. This plane is 75 yards long. Five hundred yards of gangway have been opened here, with seven breasts working. The water level is used for an air-course and travelling road. A crush took place lately which impeded mining operations considerably.

Ventilation is produced by the operation of an 8-horse steam fan, the slope being used for an inlet. The gangway is used for an in-take. The air is passed up into the working places and returned back through the breasts and headings to the fan out-let. Five visits have been made to this colliery. As fire-damp is largely generated here it was deemed necessary to give it our especial attention. The outside temperature was 70° and inside temperature 78°. Outside barometer was 28¼ and inside 28 inches. This condition of the air indicated a large portion of fire-damp mixtures in the air, and the use of safety lamps was rendered thereby necessary. Forty-nine hands were employed inside and 46 outside. Forty-nine men, 52 lights and 4 mules required 5,412 feet of pure air to sustain proper respiration, whilst by measurement it was found that only 4,200 cubic feet had been supplied. To increase this supply I directed the necessary improvement, which was complied with.

Engines.—Four steam engines=104 horse power, with 8 steam boilers; 24 wagons and 5 mules are used; 1,492 yards of T rail are laid; monthly shipments 1,700 tons; value of improvements is $50,000. On the second day of October the crush closed the colliery for the present, covering up a 40-horse steam pump and fixtures, with 20 wagons, a lot of T rail and wire rope, rendering the whole a loss.

COMMERCIAL COLLIERY.—*William Kendrick, Operator.*

This colliery is situated near New Philadelphia, upon the estate of Messrs. F. B. Gowen, G. Bast and others. It consists of three slopes sunk, some of which are sunk two lifts, but all on the F or Holmes vein. The principal slope is 300 yards deep, and ranges in angles of dip from 20° to 70° south. The character of work being done is driving gangways and breast working. The 7-feet vein is opened by a tunnel 115 yards north of the F vein, and 300 yards of a gangway are opened on it and five breasts are working. The coal runs from 3 to 12 feet thick. An east gangway is open 350 yards in, with five breasts working on it. Its coal is nine feet thick. Prior to Mr. Kendrick taking the colliery the former operators did not open a second outlet, owing to faulty ground and his inability to defray its expenses. Already 160 yards of the new outlet are excavated. In vain prospecting for the E vein heretofore had been a failure, but of late a trial with the Diamond drill proved its location a reality, with a thickness of 28 feet of solid coal. It is now contemplated to sink a shaft and make this a first-class colliery. I was compelled to restrain the former operator by a writ of injunction to work these mines, owing to the insecurity it presented to the workingmen. The use of steam pumps in slopes rapidly destroys the timber, and consequently destroys a slope that would, under ordinary care, last a number of years longer. Ventilation is produced by natural means, which is highly objectionable in the ventila-

tion of deep mines; which, indeed, is no ventilation at all. I found the place untenable from the effects of smoke, fire-damp and black-damp. Outside temperature was 54° and inside 64°. The barometer outside was at 29½ while inside it was 28 8-10 inches. This indicated the air to be in a dangerous condition. There had been 62 hands inside, 64 lights and 4 mules. This force required 8,184 cubic feet of pure air to sustain healthy respiration, whilst it was found, by measurement, only 5,616 cubic feet of impure air had been supplied.

Four steam engines are in use. A 300-horse steam pump and a 20-horse steam pump in the new lift. A 60-horse hoisting engine and a 30-horse breaker engine =410 horse, with 14 steam boilers, the condition of which is not reported; 1,698 yards of T rail are in use; 14 colliery houses, occupied by eight families; value of improvements is estimated at $70,000; monthly shipments exceed 3,000 tons; seven visits of inspection have been made=112 miles. I recommended the better repairing of the mines and a more careful inspection of the working places to secure the men from explosions of fire-damp. At present the condition of things looks promising, and a prosperous future for the colliery is anticipated.

EAST MINE LAND SALE COLLIERY.—*Messrs. Fidler and Osterman, Operators.*

This small colliery is situated north of Pottsville, on the out-crop of the North American veins, on the present estate of the P. It consists of a drift opening on the Big Tracy vein, on an angle dipping north 80°. Sixty yards of a gangway are being opened. The coal is 5 feet thick. It afforded employment to 8 hands. The improvements are valued at some $600. Its monthly shipments are=to 140 tons. At present this small place is abandoned, owing to a sudden change in the coal seam.

ST. CLAIR SHAFT COLLIERY.—*Mr. William Kendrick, Operator.*

This colliery is situated near St. Clair, on the estate of the Philadelphia and Reading Railroad Company. It consists of a shaft opening, and has been 18 years in operation. It is sunk 500 feet deep, to the E vein. There are 4 principal gangways open, working 25 breasts of coal. A large force of hands are employed in the mine. This colliery has always been one of the largest producing collieries in the region. Whilst under the management of Mr. Kendrick it is not likely to lose any of its former prestige.

The E and seven-foot coal seams are extensively mined in this shaft, and every facility that practical knowledge and the aid of machinery can render in producing coal is amply supplied. A large amount of coal that had been left untouched by former operators, who considered it an impossibility to remove it, has been reached by a safe opening, and will become a large acquisition to the annual shipments of the colliery.

Ventilation is here produced by the operation of a 15-horse power steam fan. An old slope is used for an in-take. The air is divided into spits through the different working places to the fan out-cast, which is located in the shaft opening. This system of ventilation is quite satisfactory. The temperature outside was at 60°, and inside it was at 74°. The barometer indicated 29 8-10 outside, and inside 29 6-10 inches. Fire-damp is largely produced in some districts of the mine, whilst in others it is but comparatively small; but from the present system adopted for ventilating the mine but little danger need be apprehended of explosions except from acts of careless or negligent persons.

Engines in Use.—There are 7 steam engines in use: One 500-horse Bull engine, used for permanent pumping; one 150-horse hoisting engine, a 30-horse plane engine, a 30-horse breaker engine, a 15-horse steam fan, a 13-horse boiler water feed, and a 6-horse smithing engine=744 horse, with 13 steam boilers, all of which, with their fixings, are in good condition.

Remarks.—Two persons were killed, 1 person died of injuries, 9 persons were injured, 171 persons are employed inside and 82 persons outside=253. One hundred and twelve mine wagons and 35 mules are used. Monthly shipments average 8,000 tons. Valuation of improvements is estimated at $———.

COAL DALE COLLIERY.—*Lehigh Coal and Navigation Company, Operators.*

This colliery is situated at Coal Dale, near Summit Hill, on the estate of the Lehigh Coal and Navigation Company. It consists of a tunnel 380 yards long, which opens the E vein of the colliery, has been 21 years in active operation, and the F vein is also opened some 60 yards south of the E vein, with east and west gangways open in it some 950 yards in length. The character of work done is 5 breasts open, extending gangways, opening schutes and robbing pillars.

The coal seam westward is but 5 feet thick and increases as it runs eastward to 9 feet thick. The first lift on the E seam is worked out; a prospecting slope is now sunk 100 yards deep from the present lift with east and west gangways 260 yards in length open on it; and 80 yards east of this slope a larger or hoisting slope will be open which is already in progress of completion. The coal seam at this point is 30 feet thick.

Ventilation.—This is produced by natural means, and both the F and E seams are thus ventilated and found to be satisfactory.

Engines.—There are 6 steam engines in use equal to 1,180 horse power, with 13 steam boilers, all of which with their attendant machinery and fixings are in good condition. 120 mine wagons, with 41 mules, are in use; 99 inside hands and 105 outside hands, equal to 214 persons are employed. This company has at all times complied with the provisions required by the mining law, which rendered our duties much pleasanter and greatly reduced the causes of injury to their workingmen. A proper code of rules are laid down to govern mining and are generally respected and adhered to by the men. This speaks well for Mr. Zehner, general superintendent of mines, who furnishes monthly statements of the condition of things generally, rendering me all the aid and satisfaction necessary in the discharge of my duties.

EAST PINE KNOT COLLIERY.—*Wm. Kendrick, Esq., Operator.*

This colliery is situated in Green Berry Valley, upon the estate of the P——. It consists of a slope sunk 228 yards deep on the south dip of the E vein, on an angle of 65°. The coal seam is 25 feet thick. The character of work done is extending the east gangway, working 5 breasts and driving schutes and headings. There are 1,100 yards of gangways open in this colliery, which has been in operation over 27 years. Both gangways open on the Crosby vein are abandoned, the coal of which is 12 feet thick. 117 persons are employed inside and 162 persons outside, equal to 279. The principal work done at present is getting out the loose coal and skipping old pillars.

Ventilation.—This is effected by a 25 horse steam fan. The air under the present system is caused to pass through a distance of 3,632 yards of old workings from inlet to outlet. The condition of ventilation is thus rendered unsatisfactory, as fire-damp is largely generated with other mixtures of noxious air, renders mining a dangerous operation and explosions imminent, but a vigilant watch is kept up, so that most cases of accidents result from carelessness of the workingmen.

Engines.—There are 7 steam engines in use—a 450 horse pumping engine, 2 ninety horse hoisting engines, equal to 180 horse power, a 30 horse to hoist and lower men and material with, a 30 horse breaker engine, a 30 horse plane engine, a 25 horse fan—with 22 steam boilers. Their fixings and tackle are in good condition.

October 2d, I found the outside temperature to be 68° and the inside temperature 64°; barometer outside 29 and inside at 29.4 inches, showing but little apparent danger of any explosive mixtures then; 5 visits have been made to this colliery; 117 hands are employed inside and 162 hands outside, equal to 279 hands: 62 slope wagons and 28 mules are used; 5,050 yards of 28 lbs. T rail are used; 52 tenant houses, occupied by 39 families; estimated value of improvements is $300.-000; and monthly shipments exceed 9,000 tons. 8,736 cubic feet of air had been supplied per minute, whilst 13,467 cubic feet were needed to render mining operations healthy.

I directed the necessary improvements which would remedy this evil, which would render the supply more pure and remove the noxious gases, which would be of great benefit to the workingmen.

BLACK HEATH COLLIERY.—*Adam Jackson, Operator.*

This colliery is situated near St. Clair, on the estate of the Philadelphia and Reading railroad company. It consists of a drift opening on the F or Holmes' vein; the coal seam dips on an angle of 10° south; the seam is 6 feet thick. The character of work doing is extending gangways, opening breasts and headings, which I consider safe. The colliery is small, but a new enterprise.

Ventilation is produced by natural draft, circulating through the workings upward to the out-let air hole, which is altogether objectionable. Outside temperature was 62°, and inside 70°. Barometer outside was 28½, and inside at 28 7-10 inches, with no perceptable current of the air, which rendered the air unhealthy and full of smoke.

Engines in use.—One 10-horse breaker engine, with 2 steam boilers, whose condition had not been reported. This colliery gives employment to some 16 hands. I made 3 visits to this colliery, equal to 20 miles.

MANCHESTER COLLIERIES, NOS. 1 and 2.—*Messrs. Parker and Allden, Operators.*

These collieries are situated at Wadesville, near St. Clair, on the estate of the Philadelphia and Reading railroad company. It consists of 2 slope openings.—Slope No. 1 is sunk 170 yards deep on the south dip of the Orchard or H seam, on an angle of 15°—here both south and north dips are worked with a dividing strata of 20 yards. There are 20 persons employed inside, and 7 persons employed outside. Two hundred and seventy yards of gangway has been opened, and 7 breasts are working.

Ventilation is produced by a furnace, which, in this small colliery, produces an adequate amount of air. The mine generates fire-damp. The outside temperature was 80°, and inside 66°. Barometer outside was 28, and inside 28½ inches. One 50-horse engine is used for pumping and hoisting purposes. Six slope wagons and 2 mules are used.

No. 2 slope is idle for the present, and needs no mention in connection with this report.

SPRUCE FOREST SHAFT COLLIERY.—*Joseph Dennings, Operator.*

This colliery has been 10 years in operation, but in different hands. It is situated north of St. Clair, on the estate of George Richardson, Esq. It consists of a shaft opening, sunk 75 yards deep, on the south dip of D or Skidmore vein.—The character of work doing is recovering the coal left by former operators, and gives employment to 20 hands.

Ventilation is produced by natural means, which does not produce an adequate supply, and ventilation is poor.

Engines.—There are 3 steam engines in use=100-horse power, with 6 good steam boilers; their appointments are all in good condition. There are 12 shaft wagons, 4 tenant houses, 1,000 yards of T rail in use. Improvements is estimated at $40,000. At present, no further comments is necessary in connection with this report.

RAVEN DALE COLLIERY.—*William H. Starr, Operator.*

This colliery is situated north-east of Port Carbon, on the estate of the Philadelphia and Reading railroad company. It consists of a slope, sunk 300 yards deep, on the south dip of the Primrose or G vein, on an angle of 30°. This colliery has been in operation 18 years. The character of work doing, is driving gangways, opening breasts, schutes and headings. The mines are divided into 2 working panels. The western panel is 925 yards long, working 16 breasts with 60 men; the coal is 20 feet thick. The eastern panel is 800 yards long, working

9 breasts with 36 men; the coal is 10 feet thick. The outside force consists of 75 hands. The total force employed is 171 hands.

Ventilation is produced by the operation of a 20-horse steam fan. The air is separated into two spits, traversing the working places regularly to the fan outcast. By measurement the quantum of air supplied was found to be but 3,360 cubic feet per minute, whilst 8,712 cubic feet were needed for a healthy supply of fresh air for the force employed. The outside temperature was 64°, and inside temperature 60°. Barometer outside was 29 7-10, and inside 29 8-10 inches. This investigation showed that but very little explosive mixtures had been present in the air at that time.

Engines.—Four steam engines are in use=160 horse power, with 10 good steam boilers. All their equipments are in good condition. There are 2,400 yards of T rail in use. Valuation of improvements is estimated at $70,000. The monthly shipments exceed 6,000 tons.

Remarks.—The mines produce fire-damp largely. I recommended the use of another 20-horse steam fan on the eastern district, owing to the extensiveness of the excavations. This system would overcome any quantity of noxious air that may be produced, and would prevent the chances of explosions. Ventilation would be permanently established, and would relieve the miners of much fear and danger. An apparent desire on the part of the operator is evident, and the future of the colliery is hoped to be prosperous.

GLENTWORTH COLLIERY.—*Diamond Coal Company, Operators.*

The colliery is situated at Eagle Hill, north of Port Carbon, on the estate of the P. and R. R. R. Co. Has been twelve years in operation. It consists of two double track slopes. No. 1 slope is sunk 330 feet deep on the south dip of the F or Holmes vein, on a 30° angle. It has been comparatively idle for the last two years. No. 2 slope is sunk in 3 lifts on the south dip of the G or Primrose vein. The F vein opens into the G vein gangway 81 yards east of the slope by a tunnel 53 yards long. The quality of the coal is excellent, and the seam runs from 10 to 12 feet thick. Drainage, ventilation and the character of the work done renders satisfaction. The coal seam of the G vein is from 14 to 30 feet in thickness. Mining of coal here is conducted upon a practical principle, which affords stability to the mine and safety to the workingmen.

Ventilation is produced by a 10-horse steam fan, which supplies an adequate amount of fresh air, and is conducted on a practical system. Fire-damp is largely generated in the mine, yet explosions under the present system of ventilation are not imminent. I found the outside temperature to be 62°, and inside at 70°. The barometer indicated a pressure of 29¼ outside and 29 3-10 inches inside. This test indicated a portion of fire-damp in the air but not sufficient to explode. The quantum of air supplied was found to be 6,268 cubic feet, whilst the legal supply required would be but 4,224 cubic feet per minute. However, there is no rule to govern ventilation in a mine that produces gases, but a copious supply of fresh and pure air properly conducted to the working places on its inward and outward course.

Gangways.—There are some nine hundred yards of gangways open, working 9 breasts; opening schutes, headings and gangways—all of which work renders satisfaction.

Engines in Use.—Six steam engines are used at the colliery, viz: One 50-horse hoister, a 50-horse steam pump in lower lift, a 50-horse steam pump in upper lift, a 25-horse breaker engine, a 10-horse fan, a 20-horse pump=205-horse steam power, with 8 good steam boilers, with all their equipments, and apparently in good condition.

Valuation of improvements estimated at $60,000. There are 25 slope wagons and 5 mules in use; 16 tenant houses, stables, shops, etc., 2,000 yards of T rail in use; 37 inside hands, 42 outside hands=79 persons employed. Monthly shipments, some 7,000 tons. No accident recorded against the colliery during the year.

NEW CASTLE COLLIERY.—*John R. Davis, Operator.*

The colliery is situated west of New Castle, on the estate of the Philadelphia and Reading railroad company. It consists of a drift opening on the south dip of the E vein and Seven Feet vein. These two seams are divided by 3 feet of a slate strata. The E seam is 40 and the Seven Feet seam is 30 feet thick. The dip of these seams is 20° south, and will admit of breastings 140 yards long from the level of the working of the late Mr. G. S Ripplier. At present the gangway openings are 130 yards long, and ventilated by natural means. A breaker of large capacity is in course of construction. Monthly shipments will exceed 6,000 tons. Value of improvements, $50,000. The number of persons employed inside is 20, and outside 20, with 3 mules and 6 mine wagons. Four hundred yards of T rail are now in use.

MAMMOTH VEIN COLLIERY, (NEW.)—*Joseph Dennings, Operator.*

The colliery is situated west of New Castle, on the estate of the Philadelphia and Reading railroad company. It consists of a tunnel opening driven 60 yards north to the E and Seven Feet coal seams, which dip 45° south. The partition slate is only 2 feet in thickness. The coal seams, collectively, are 60 feet thick. Two hundred and eighty yards of gangways are opened. A new slope is sinking, and a breaker is in course of construction, all of which improvements will be in full operation in the spring. The shipments are estimated at 6,000 tons per month. There are 12 men employed. A 25-horse breaker engine, 4 steam boilers, 3 horses, 4 mine wagons and 500 yards of T rail are in use. The improvements are valued at $20,000. At present ventilation is produced by natural means. A prosperous future is anticipated for the colliery, Mr. Denning being well schooled in mining and in the practical management of mines from youth.

BULLOCK COLLIERY.—*John H. Thomas and E. J. Price, Operators.*

This colliery is situated north-east of Minersville, on the estate of Bullock and Brothers. It consists of 2 drift openings on the Peacock and Cockle red ash veins. Five hundred yards of gangways are opened on the Cockle vein, the coal of which is 4 feet thick, with 40 yards of breastings. Six miners are employed in this district. The Peacock gangways are 550 yards long, with only 2 feet of workable coal in the seam, employing 4 men. Ventilation is produced by natural means, of which there is a sufficient supply. The coal is broken by horse power. Four hundred yards of track are laid. Fourteen hands are employed. Three head of stock and 7 mine wagons are used. Monthly shipments exceed 700 tons.

GLENDOWER COLLIERY.—*Thomas Schollenberg, Operator.*

The colliery is situated at Glendower, on the estate of the P. and R. R. R. Co. It consists of a double track slope sunk 300 yards deep, on the north dip of the Crosby seam. A tunnel from this level 80 yards long opens the south dip of the Crosby vein. The seams are 18 feet thick. 85 hands are employed in the mine. The character of work doing is extending gangways, opening schutes and headings, and working 15 breasts, all of which are based upon a practical system of mining.

Ventilation is produced by the operation of a 50 horse steam fan. The main air column is divided into spits and conducted into and out of the different working districts in a safe and practical manner. The western division of the mines is ventilated by a 25 horse fan, and a like system of ventilation adopted. The outside temperature was at 58°, and inside temperature 52°. Barometer indications outside was 28¼ and inside 29.2 inches. The quantum of air supplied per minute was 7,571 cubic feet for 85 men, 95 lights and 10 head of stock. 10,230 cubic feet of pure air was required per minute. Only one death has occurred during the year.

Engines.—There are eight steam engines in use, equal to 975 horse power. Two 90's as hoisting engines, one 600 horse Bull pump, 2 steam fans, a 50 and a 25 horse, a 60 horse at old slope, a 30 horse breaker engine, and a 30 horse plane engine, with 23 steam boilers, together with all their equipments, are in good condition. There are 165 hands employed; 85 slope wagons and 19 mules in use; 8,358 yards of 25 lb. T rail are used. Monthly shipments at present are 5,000 tons. Value of improvements is estimated at $300,000. A 50 horse engine is used to hoist and lower men and material in the mines, equal to 9 engines of 1,025 horse power.

EAGLE COLLIERY.—*George John & Bro.*

The colliery is situated in St. Clair, upon the estate of the Philadelphia and Reading R. R. Company. It has been in full operation for 33 years. It consists of —— slope sunk on the south dip of the E vein and two drifts open on the D vein, and the Seven Feet vein is worked in conjunction with the E vein. There are 102 hands employed in the different districts of this extensive colliery, working only seven breasts and robbing out pillars and loose coal, which is remarkable for such extensive old mines. The condition of the gangways and of ventilation is excellent. One person died of injuries and six were injured during the year.

Ventilation is produced by furnaces and outcast air-holes. Under a practical system it renders ventilation safe, as very little fire-damp is given off, and necessary precautions maintained for the safety of workingmen. The outside temperature was at 60°, and inside at 60°. Barometer indicated 28.8 outside and 28.8 inches inside. The supply of air was 23,580 cubic feet per minute for 102 hands, 112 lights and 10 head of stock, equal to 176 men, the legal complement being 11,616 cubic feet per minute.

Engines in use are six, equal to 255 horse power, with 13 good steam boilers, which with their equipments, &c., are all in good condition.

TAMAQUA SHAFT COLLIERY.—*Messrs. Mackey & Walker, Operators.*

The colliery is situated east of the borough of Tamaqua, upon the estate of the Philadelphia and Reading R. R. Co. It has been in operation 15 years. It consists of a shaft and drift opening. The shaft is sunk 100 yards deep on the E vein. Four different gangways are operated on this lift. The E, F, D, and double Q gangways, or four different coal veins, approach by four tunnels, whose total length is 280 yards. The coal seams run up from 6 to 14 feet in thickness and of very good quality. The drift is open south of the shaft on a line with the breaker surface level. Considerable coal is now mined in this drift. Owing to a want of proper timbering of portions of these gangways, and no second outlet for miners' safety, I directed proceeding in injunction against the further working of the mine in contravention of law until this matter of complaint be complied with.

Ventilation is produced by the operation of a 20-horse steam fan, which does not satisfactorily supply the needed quantum of air to make it healthy for the workingmen. This evil is caused chiefly from the smallness of the air-course connections and an objectionable system of managing the air, which I insisted upon being discontinued and to adopt a better and different plan, which proved a success when completed. The outside temperature was found to be 80°, and inside at 68°. The barometer here indicated 29 outside and 29.4 inches inside. The indications were that the air had but very little mixtures of explosive matter.

Engines in use.—There are seven steam engines in use = 235-horse power, with 13 steam boilers, all of which fixtures and appointments appeared to be in good ordinary condition. 22 hands were employed inside and 30 hands outside. There are 47 mine wagons and 14 mules used. 8,000 yards of 25 lb. T. rails are used. Monthly shipments exceed 1,800 tons. Improvement valuation is estimated at $250,000. Only two persons were injured during the year. The P. and R. R. Co. have lately leased this large property and are making liberal expenditures in putting it in proper condition for making it a good colliery. It fell into decay under a system of sub-operators, who sacrificed the permanency of the works to save what money they could by curtailing expenses where it was imperatively necessary to expend it, hence the decay of the works.

FORESTVILLE COLLIERY.—*Daniel Hock & Co., Operators.*

The colliery is situated at Woodside, west of Minersville, on the estate of the P. and R. R. R. Co. It consists of a slope, sunk 50 yards deep on the south dip of the Black Heath vein, on an angle of 25°. It has been in operation 27 years. The D vein is opened into by a tunnel 25 yards in length some 380 yards east of the bottom of the slope. Both gangways are open 830 yards, with 19 breasts working and schute and headings. The coal is six feet thick, with a safe rock top. A drift is open 800 yards west of the slope upon the same vein. One hundred and five persons are employed inside. No accident has occurred at the colliery this year.

Ventilation is produced by a furnace in the slope workings. The drift is ventilated by natural means, both of which have given tolerable satisfaction. November 28 outside temperature was 46° and inside 56°. Barometer outside was 28 8-10 and inside 28¼ inches, thus indicating the air to contain some little of an explosive mixture. The management of the mines is under strict regulations, and unless a mere accident little danger need be apprehended.

Engines in use.—There are three steam engines in use=70 horse power, with six steam boilers, which, together with all their appointments, are in good condition. There are 105 hands employed; 4 visits have been made=64 miles; 38 mine wagons and 5 head of mules are used; 3,000 yards of T rail are used; value of improvements is estimated at $40,000.

MONITOR COLLIERY.—*Rowland & Co., Operators.*

The colliery is situated at Wadesville, on the leased estate of the Philadelphia and Reading railroad company. It consists of a double track slope, sunk 110 yards deep on the south dip of the G or Primrose vein, on an angle of 23°. The colliery has been nine years in operation, but the drift levels have been worked for over thirty-three years. Thirty-four hands inside and twenty-one hands outside are employed at the colliery. The management of the mines is not to satisfaction. Annually a new party operates the mine, and like all such leased collieries an eye to the curtailing of expenditures is their ruin.

Ventilation is produced by a 6-horse steam fan, which under the present plan is not equal to the needed supply. The distance the air is forced to travel is too great. The leakages are too many and the power too light, &c. Gangways open are three, equal to 1,280 yards in length, with six breasts working, extending gangways, schutes and headings, &c. A considerable amount of fire-damp is here generated.

Three engines=86 horse power, with five steam boilers. The east gangway is used for an ingress and egress road for miners. Improvements consist of a slope house, shops, breaker, 3 tenant houses, 20 slope wagons, 8 head of mules, 2,800 yards of T rail, &c., valued at some $30,000.

PHŒNIX PARK COLLIERY.—*James O'Malley, Operator.*

This is a small colliery, situated at Phœnix Park, on the present estate of the P. and R. R. R. Co. It has been some four years in operation. It consists of a drift open on the Peach Mountain vein. The seam dips on an angle of 20° south. The coal is seven feet thick. Seventeen hands are employed. Ventilation is produced naturally and considered very good. One hundred and twenty yards of gangway are open, working three breasts, schutes and headings. Thirty yards above the lower lift a counter gangway is worked with 40 yards of breastings on it. The coal is prepared over horse-power rollers. Its shipping capacity is 400 tons per month. No gas as yet appears to invade the mine, although it is known the seam generates fire-damp largely in other localities, and often resulted in serious consequences.

DIAMOND COLLIERY NO. 2.—*Lewis Sutter & Co., Operators.*

The colliery is a small one, situated north-east of Pottsville, upon the estate of the P. and R. R. R. company. It consists of a drift, open on the Diamond or J vein. The coal is six feet thick. The seam dips on an angle of 35° south; is excellent, and of a red ash quality. The gangway is now open some 400 yards, with 3 breasts working on it.

Ventilation is produced by natural means, which acts sufficiently good at present. A breaker for preparing the coal is run by a 10-horse engine, of one boiler capacity. There are —— men employed; 6 drift wagons, and 2 head of mules are used; 400 yards of T rail is used; monthly shipment, 500 tons.

EAST MINE MAMMOTH SHAFTS.—*General Pleasants, Director General.*

These shafts are situated at the East Delaware mines, upon the estate of the P. R. C. and I. Co., 2 miles north of Pottsville; are now under progress of developing the deep seams in that basin. These devolopments consist of two shafts and a slope opening; the slope opening contains a section area of 147 square feet, the dips of which is 60° north; the slope will be exclusively used for the drainage of the shafts by means of tunnels connecting the openings together as aqueducts; very little water has been encountered at a depth of 400 vertical feet, below the water line of the valley The east shaft will be exclusively used for coal outlet, having two compartments throughout its whole depth. The west shaft will be of a similar construction, but in three compartments, and made as an outlet for coal, men and mine material.

August 3, 1871, the sinking of these openings commenced; but not till January 17, 1872, the regular sinking commenced; the full depth of shaft completed in January 1, 1873, was 510 feet. The flat vein was reached at a depth of 108 feet; Little Tracy seam at 250 feet; Big Tracy seam at 477 feet, in its basin, its north dip at an angel of 75°, its south dip, 34°. A new system of rock excavation has been introduced and successfully prosecuted. This consists of rotary diamond drills, operated by Root engines; the diamond drill bit is secured to gas pipe shaftings, extended in additional sections until the desired depth has been reached; water is forced through these pipes under a pressure of 100 lbs. per square inch, for cooling the drills and washing out the sediment. A number of these holes are bored to any required depth, they are then filled with coarse sand, the sand is removed to suitable depths, and blasting and excavation commences, and prosecuted until the bottom is reached, when the drills are again placed in position and boring again commences. The machines are propelled by compressed air. The best drilling was 79 feet in 12 hours and by 80 feet of blasting in one month. The preparatory improvements, etc., were commenced September 1, 1871, at the West shaft, and a depth of 230 feet has been reached. January 1, 1873, with similar success, an explosion at this shaft occasioned considerable delay. It is anticipated that the E seam will be reached in the east shaft by the first October, 1874, when suitable buildings will be constructed and coal shipping commence.

HICKORY COLLIERY.—*Hickory Coal Company, Operator.*

This old colliery is situated at St. Clair, upon the present leased estate of the Philadelphia and Reading railroad company. It has been in operation for over 30 years. It consists of a double track slope, sunk 300 yards deep, on the south dip of the E vein, at an angle of 20°.

Mr. John Pinkerton was the first to open this colliery, and successfully operated it up to 1854, at which time it came into the hands of Mr. William Milnes, who, in his term, operated it up to 1866, at which time it came into the hands of the Hickory coal company, and latterly it came into the hands of the Philadelphia and Reading railroad company by lease and purchase. The slope has 4 lifts. The E and seven foot seams are worked at present; the former seam is 30 feet, and

the latter is 9 feet thick. Some 525 yards of gangway is now open as new work; all the old openings are idle. Twenty-one hands are employed at the time, but then very little work had been doing.

Ventilation is produced by natural means, which is not quite sufficient for an increased operation. The temperature outside was at 78°, and inside at 76°.—Barometer outside indicated 28 6-10, and inside 29 1-10 inches. The quantum of air supplied, was 3,040 cubic feet per minute.

Engines in use.—Three steam engines=145-horse power, with 4 good steam boilers, all of which are in good condition. Twenty slope wagons and 2 head of mules, and 2,600 yards of 25 lb. rails are used. Monthly shipments exceeds 3,000 tons. Value of improvements is $10,000.

MINE HILL GAP COLLIERY.—*William Kendrick, Operator.*

This colliery is situated at the Mine Hill gap, on the estate of the Philadelphia and Reading railroad company, leased from James Dundas, Esq., and previously operated by Kear Brothers. It has been in active operation for 26 years. It consists of 3 slope openings, viz:—A double track coal slope, a pump slope and a material and workingmen carriage slope. The coal slope is sunk 300 yards deep on the north dip of the E vein, and so are the others, and are of equal depth. The colliery buildings are of stone, and of their class very substantially constructed. There is a large body of coal open in the mine, and a considerable amount of firedamp is generated, but ample provisions have been made to subdue its influence. For its adaptation for coal production, drainage and accommodation for miners, it has not any superior in the region.

Ventilation is produced by a 20-horse steam fan; the air is divided into spits, ventilating each separate district in a practical manner.

Gangways.—There are 8 main gangways operated. The coal mined in the upper tier of gangways is discharged into schutes, and loaded in connection with the coal mined in the lower level. The refuse coal, slate and rock, in the upper workings, is stowed away inside, and is used in supporting the roof.

Engines in use.—Nine steam engines are in use at the colliery; aggregate power is equal to 482-horse, with 16 steam boilers, with all their equipments and fixings in good condition.

There are —— hands employed inside, and —— hands employed outside; —— mine wagons are in use, with —— head of mules. Monthly shipments exceed 10,000 tons. Value of the improvements of every kind, is estimated at $500,000. Three visits, of 24 miles, has been made. One person was killed during the year; this was the only accident that has happened. There are —— persons employed in and about the colliery.

SWIFT CREEK.—*Gideon Bast & Co., Operators.*

This colliery is situated west of Tuscarora, on the estate of the operators. It consists of a double track slope, sunk 110 yards deep on the south dip of the Holmes or F vein, on an angle of 65° dip. Five hundred and fifty yards of gangways have been opened in the mine, but a fault in the seam occasioned the suspension of mining most of the year. The colliery is at present idle, and has been only two years in operation.

Engines.—There are 2 steam engines in use=145 horse, with 8 steam boilers, whose condition is good. The improvements are estimated at $50,000. Two visits of 44 miles have been made. The colliery, when in full operation, would give employment to 160 hands. Two persons were injured during the year.

ALASKA COLLIERY.—*Gen. Henry L. Cake, Operator.*

The colliery is situated in the northern limits of the borough of Tamaqua, upon the estate of the Mammoth coal and iron company. It consists of 2 drift line gangways, opening westward, on the south dip of the A and C veins, at angles of 80°. This colliery is idle mostly during the year. There are 2,100 yards of gangway open. The breasting lift on these drifts is 190 in length. The coal is from 7 to 10 feet thick. Ventilation is produced by natural means. Both seams generate fire-damp, with a large portion of black-damp.

Three steam engines are used=55-horse power, with 5 steam boilers. Their condition has not been reported. Eighty-two hands are employed when in operation. Forty-six wagons and 15 mules are used. The monthly coal shipments are 5,000 tons. Value of improvements, $50,000. There are 2,800 yards of T rail used.

WABASH COLLIERY.—*William Kendrick, Operator.*

This colliery is situated a mile south of Reeves Dale, upon the estate of the P. R. Coal and I. Co. It consists of a double track slope sunk on the G or Primrose vein on an angle of 73° north. The slope is 185 yards deep. 100 yards west of the slope level an 80 yard tunnel opens the E seam south of the G seam, and 18 yards further south the cross-cut seam is also open. The coal runs from 6 to 16 feet thick. 1,500 yards of gangways are opened, working only 4 breasts, but are driving gangways, schutes and headings, and removing loose coal.

Ventilation is produced by a 25 horse steam fan. These seams generate fire-damp, but the distribution of the air supply into the panels, and its return is under a practical system and the supply ample for the purpose and at present gives satisfaction. No accident occurred during the year. Ample provision has been made for egress and ingress and for the safety and health of the workingmen.

Nine steam engines are in use = 694-horse power, and 17 steam boilers, with all their appointments, are in good condition. There are 40 slope wagons and 14 mules used; 1,621 yards of 30 lb. T rail used; 13 tenant houses, occupied by 12 families; 47 inside and 97 outside hands are employed; monthly shipments exceed 6,000 tons; value of improvements is estimated at $300,000. Four visits = 128 miles, have been made.

November 13th, the temperature outside was 50° and inside 62°. The barometer outside indicated 29 and inside 29¼ inches. These indications were favorable. The quantum of air supplied was 7,351 cubic feet per minute for the legal complement, being 6,666 for 47 hands, lights and 8 mules, the condition of ventilation being fully satisfactory. The colliery has been in operation for three years, and latterly the estate and collieries have come into the hands of the P. & R. R. Co. by lease and purchase rights.

REEVESDALE COLLIERY.—*Reevesdale Coal Company, Operators.*

The colliery is situated at Reevesdale, west of Tamaqua, upon the estate of the Mammoth coal company. It consists of a drift tunnel driven 450 yards south, to the R seam. This seam is the underlying seam in this basin. The O, G, F, E, Q, double Q and R seams are open in this tunnel. The dip of these seams is on an angle of 70°. Except the R vein, all the others have been worked out upon this tunnel level. Nine hundred yards of gangways have been opened on the R seam, working 4 breasts, schutes and headings, with 20 hands employed in them. The coal runs from 5 to 20 feet in these veins.

Ventilation is produced by natural means and practically applied in the eastern panel. The western panel is not as favorable. The outside temperature, November 14, was 60°, and inside 68°. The barometer indicated 28 8-10 inside, and outside 28 9-10 inches, which condition appears favorable.

To better the condition, and to increase the supply of air for the safe working of the mine, I directed that the needed improvements be made at an early day.

Two steam engines are used at the colliery=50-horse power, and 3 steam boilers, whose condition has not been reported. Eight hundred and fifty yards of

25 lb. T rail has been in use. Forty hands are employed at the colliery. Sixteen drift wagons and 6 mules are used. The monthly shipments of coal are ——— tons. Value of improvements, $20,000.

NEW KIRK COLLIERY.—*Fry, Shoemaker & Co., Operators.*

The colliery is situated west of Reevesdale. It has been 30 years in active operation. The estate is owned by the Philadelphia and Reading railroad company. It consists of a double track slope, sunk 114 yards deep on the south dip of the ——— vein, on an angle of 45°. A tunnel from the slope level opens the F, E, cross-cut and D seams. This tunnel, from the slope gangway to the F seam rock, measures 45 yards. The rock tunnel to the E seam is 100 yards; to the cross-cut is 12 yards, and to the D is 35 yards. The coal in these seams runs from 4 to 22 feet in thickness. A tunnel opens the Washington seam, which is 5 feet in thickness. The character of work done is quite safe.

Ventilation is produced by a 20-horse steam fan, which produces a sufficient supply of air for mining purposes. November 15 the temperature was 54° outside, and inside 64°. The barometer indicated 29 outside, and 29 3-10 inside. The condition of ventilation is greatly improved.

Five steam engines are in use, whose aggregate power is 430-horse, with 19 good steam boilers, with all their equipments, and are in good condition. There are 12 gangways open in the mine; 350 yards of openings. Four thousand yards of T rail are used. Fifty slope wagons and 14 mules are used. Value of improvements, $ ———.

SILVER CREEK COLLIERY.—*William & Thomas Williams, Operators.*

This colliery is situated at Silver Creek, on the estate of Swayne & Able. It has been 12 years in operation. It consists of a double track slope, sunk 100 yards deep on the south dip of the D vein, on an angle of 30°. A tunnel 86 yards long opens the E vein. There are 2,350 yards of gangways opened upon the colliery, working seven breasts, opening schutes and headings. The coal in the upper seam of the E vein is 14 feet thick. A large portion of the mine is being worked out. The breaker building and fixtures were destroyed by fire in November, which caused the suspension of shipments since.

Ventilation is produced by a 10-horse steam fan, which is conducted upon a practical system, which produces a sufficient supply of air for all purposes. So far no fire-damp has been generated.

Five steam engines are in use, equal to an aggregate of 180 horse power, and 10 steam boilers, with all their fixtures, were found to be in good condition. Forty inside and fifty outside hands are employed when the colliery is in operation. Sixty slope wagons and sixteen mules are used; 4,000 yards of 25 pound T rail are used; monthly shipments exceed 3,500 tons; value of improvements is estimated at $50,000; one person was injured during the year.

PINE FOREST SHAFT COLLIERY.—*William Kendrick, Operator.*

This colliery is situated east of St. Clair. Has been eight years in active operation by George W. Snyder, Esq., but of late it came into the hands of the P. R. Coal and Iron Co. It consists of a double cage track shaft, sunk 100 yards deep upon the south dip of the E seam. The coal strata has a dip of 43° south. The Seven Feet and D veins are opened by tunnels from the E gangway. Four principal gangways are open. Thirty-three breasts are worked, with such schute and headings as are necessary, employing 80 hands inside. The character of the work is considered safe. Latterly the mines become free of fire-damp, which was heretofore a terrible menace to mining operations, requiring the greatest vigilance, with the necessity of the constant use of the safety lamp to enable the workingmen to cope with this scourge of the mine.

Ventilation is produced by a 25-horse steam fan. The air is properly divided into spits and conducted upon a practical plan, which renders the mine in so safe a condition that the safety lamps are at present unnecessary. November 18, the temperature outside was 50° and inside 62°. The barometer outside indicated 29 3-10 and inside 29 7-10 inches. This condition of the air indicated it to be free from noxious mixtures. The quantum of air supplied was 25,000 cubic feet per minute, whilst the legal supply would be 10,500 cubic feet per minute.

Six steam engines, equal to 855 horse power, are in use, and 29 steam boilers, which, with all their appointments, are kept in good condition. There are 11,055 yards of 25 pound T rail used; 46 tenant houses, 72 mine wagons and — mules are used; monthly shipments exceed 10,000 tons; value of improvements, $——.

HICKORY SHAFT COLLIERY.—*William Kendrick, Operator.*

The colliery is situated at Wadesville, upon the estate of the P. R. Coal and Iron Company. It has been in active operation the last ten years. It consists of a double track cage-way and pump chamber; is sunk 694 feet deep to the south dip of the E vein. The coal is 32 feet in thickness. The operations of the colliery were retarded some weeks in summer by the discovery of a portion of a district or panel of the coal taking fire under unknown circumstances. The colliery was threatened with destruction from the advances made by the fire. It was finally decided to inundate the mine, which was a heavy undertaking. This being finally accomplished it had the desired effect, and the safety of the mine was accomplished. Under the unremitting exertions of Mr. Althouse, manager of the colliery, the work has been carried out successfully, and is once again in full and satisfactory operation.

Seven principle gangways are working, with 47 breastings, schutes, headings, &c., employing 120 hands, 1,830 yards of gangway opening and two inclined planes of 247 yards each. The E and Seven Feet seams are worked in conjunction, and in lifts proper for mining, the character of which is considered a safe operation.

Ventilation is produced by a 30-horse power steam fan. The supply of air is tolerable good, but owing to the presence of so much fire-damp and noxious mixtures it is decided to improve the means of ventilating the mine and secure a larger supply for all occasions, though little or no complaint has been made of any want of air supply.

There are 7 steam engines in use, whose aggregate power is 670-horse, and 20 good steam boilers with all their equipments are in good condition. One hundred mine wagons and 30 mules are used; 385 persons are employed. The present monthly tonnage exceeds 10,000 tons; it is confidently expected 20,000 tons can be shipped monthly in the spring. The value of this colliery is estimated at not much less than $1,000,000.

GREENWOOD COLLIERY, NO. 1.—*Eugene Borda, Esq., Operator.*

The colliery is situated at Greenwood, east of Tamaqua, on the estate of the Lehigh coal and navigation company. It consists of a slope sunk 213 yards deep on the south dip of the E vein, on an angle of 43°. The E and cross-cut veins are worked west, and stands idle. An 80 yard long tunnel is driven southward in the basin, to open the north dip of the E vein, and 250 yards east of this tunnel, another tunnel is open 40 yards into the cross-cut vein; the coal is 90 feet thick, but a little soft; the D vein is also open and the parting rock is only 9 feet thick. The character of work doing is getting out the loose coal, which, at best, is a dangerous undertaking.

Ventilation is produced by a furnace arrangement which does not fully supply the necessary amount of air needed. I directed the necessary improvements to be commenced, which, when completed, will fully supply all wants.

Four steam engines are in use equal to 146 horse, and 7 good steam boilers with all tackle and appointments are in good condition. Forty wagons and 13 mules are used; 61 inside with 21 outside hands are employed; monthly shipments is 4,000 tons. Outside temperature, November 20, was 36°, and inside 60°. Barometer outside 28.8 and inside 29.2 inches.

GREENWOOD COLLIERY, No. 1.—*Eugene Borda, Esq., Operator.*

This colliery is situated at Greenwood, east of Tamaqua, upon the estate of the Lehigh Coal and Navigation Company.

It consists of a slope sunk 282 yards deep on the F or Holmes seam on an angle of 50° south. Driving breasts, gangways, schutes and heading is the character of the work doing. A tunnel 70 yards west of the slope opens the E vein, with 66 yards of rock parting. The seam is 25 feet thick. 1,500 yards of gangway is operated, working 10 breasts, schutes and heading. A proper compliance with the requirements of law is carefully maintained.

Ventilation is produced by two steam fans, each a fifteen-horse power, one on each seam, and its condition is satisfactory. November 22d, the outside temperature was 40° and inside 65°. The barometer indicated outside 28 and inside 29.3 inches. The supply of ventilation was 10,340 cubic feet of air per minute.

Seven steam engines are used = 851-horse power, and 21 good steam boilers with all equipments are well conditioned. Sixty slope wagons and 25 mules are used; 135 hands are employed; 3,380 yards of track is used. Monthly shipments exceed 5,000 tons. Value of improvements is estimated at $——.

BEECHWOOD COLLIERY.—*William Kendrick, Esq., Operator.*

This colliery is situated at Mount Laffee, and has been 37 years in operation. At present it belongs to the P. and R. R. R. Co. It consists of a double track slope sunk 300 yards deep on the south dip of the E vein, on an angle of 49°; some 14 gangways whose aggregate length is 30,000 yards. There are 54 breasts working and schutes and headings. The management of the mines was at first a difficult task, chiefly due to crushings and the large amount of fire-damp generated. This difficulty is obviously overcome.

Ventilation is produced by a 30-horse steam fan, which operation is based upon a practical system giving quite a satisfactory result, as follows: the number of cubic feet of air supplied in the following districts per minute—in the lower lift 19,000, in the new slant 7,400, in the old slant 8,500, in the tunnel 14,590, in the west spit 8,700, and in the outlet 58,190 cubic feet per minute. No fire-damp could be found, and these conditions are fully satisfactory. One person had been accidentally killed and twelve persons were slightly injured.

Six steam engines are in use = 226-horse, and 12 good steam boilers and condition of the same reported, with all machinery connected with the colliery is kept in good repair. Ninety slope wagons and 22 mules are used; 30,600 yards of track are used; 15 tenant blocks; 336 hands are employed, 235 of which are inside hands. Monthly shipments are 10,000 tons; value of improvements estimated at $——.

YORK COLLIERY.—*Llewellyn & Company, Operators.*

This colliery is situated west of Pottsville, on the estate of A. Russell and others. It is three years in operation. It consists of a single track slope sunk 55 yards deep on the south dip of the gate vein, on an angle of 55°. The west gangway is 550 yards long, working four breasts. The coal is seven feet thick. The colliery gives employment to 20 hands.

Ventilation is produced by natural means, which is only moderate. One steam engine is used of 20-horse with two steam boilers. Six mine wagons and 600 yards of track are used; yearly shipments are 2,000 tons. The colliery is a land sale and its shipments depend to be stimulated by the season of the year more than upon the common market.

YORK FARM COLLIERY.—*Job Rich, Operator.*

This colliery is situated west of Pottsville, on the estate of the old York company. It has been 38 years in operation. It consists of a single track slope, sunk 150 yards deep, on the south dip of the tunnel vein, on an angle of 28°. The coal

is 7 feet thick, and 2 gangways operates both south and north dips. The basin dips westward, and to continue mining on this lift, drainage will, in that event, become a difficult matter.

Ventilation is not adequate, and consequently very unhealthy for men to work amongst smoke and noxious air.

Mr. Rich is a very practical miner in his way, and manages matters to the best wishes of his few hands. A furnace is used, but its action is not adequate to furnish a sufficient supply of air.

One 20-horse engine and 2 steam boilers are used, which have not been legally examined. Four hundred yards of track is used; 8 inside hands and 4 outside hands are employed, with 4 wagons and 1 mule.

SHARP MOUNTAIN COLLIERY.—*Joseph Wood, Operator.*

This colliery is situated on the Sharp mountain, south of Pottsville, upon Mr. Richards' estate. It consists of a single track slope, sunk 110 yards deep, on the Bartlofe vein. The coal seam is 7 feet thick. A tunnel 55 yards long opens a white ash seam 7 feet thick, and the coal is disposed of to the citizens. Twelve persons are employed in and about the colliery.

Ventilation is produced by natural means, and found satisfactory. No accidents occurred during the year. Two engines of 25-horse power are used with 1 boiler; 8 slope wagons, 2 head of mules and 900 yards of T rail is used. Monthly shipments —— tons. Value of improvements is $8,000.

TAMAQUA DRIFT COLLIERY.—*Messrs. Mackey and Walker, Operators.*

This small colliery is situated south of Tamaqua, upon the estate of the Philadelphia and Reading railroad company. It consists of a drift open on the D seam, the gangway of which is 700 yards in west. A tunnel 21 feet long opens the P seam on this gangway. The P seam is 90 feet thick, and the coal mined in this drift is prepared at the shaft breaker. The mine is properly managed and safe.

Ventilation is produced by a furnace, in a practical way, and is considered very good. This colliery employs 24 hands, and has 780 yards of gangways opened; 3 breasts, with schutes and headings are working, which I consider safe. Seventeen mine wagons, 3 mules and 900 yards of track are in use. Monthly shipments 3,000 tons.

YORKVILLE COLLIERY.—*Baltaiser & Co., Operators.*

This colliery is situated in Yorkville, west of Pottsville, upon Mr. Richardson's estate. It consists of a drift driven 64 yards south to a white ash vein; 40 yards east of this tunnel a slope is sunk 40 yards deep, and a like slope is sunk west of it 50 yards deep. Three hundred and forty yards of gangways are open on this new lift, working 3 breasts, etc.; the coal is 5 feet thick.

Ventilation is produced by natural means, and so far it is sufficient for present mining operations. Sixteen persons are employed in and about the colliery; 4 mine wagons and three mules are used. Annual shipments 2,000 tons. Having no outlet to market, the shipment of coal is necessarily confined to the borough. With an outlet, a considerable amount of good coal could be mined from this place. Hauling to the railroad would incur an unwarrantable expense, and would necessitate a re-handling of the coal, which would produce a waste, hence the colliery must be confined to its present condition. Value of improvements, $3,000.

LAMBERT COLLIERY.—*Samuel Morgan & Co., Operators.*

This colliery is situated West of New Philadelphia, upon the estate of ——————. It consists of a double-track slope, sunk 200 yards deep on the south dip of the Palmer vein, on an angle of 30°. The present mining is confined to the second lift. The seam is four feet thick. Two gangways are open 1,180 yards long; working 15 breasts, schutes and heading. 70 yards east of the bottom of the slope a tunnel is in progress of construction to open the Potts vein. The mines are well managed for safety, drainage and ventilation.

A 10-horse fan produces ventilation, which is constructed upon a practical plan. 52 persons are employed inside and 30 outside.

3 steam engines are used, (85-horse,) and 7 good steam boilers, with all their fixtures and machinery, are in good condition. 30 mine wagons and six mules are used. 2,000 yards of T rail is laid. Monthly shipments are 4,000 tons. Value of improvements is estimated at $30,000.

NEW PHILADELPHIA COLLIERY.—*Hine & Co., Operators.*

The colliery is situated east of New Philadelphia, upon the estate of the P. and R. R. R. Co. It consists of a shaft sunk 100 yards deep, on the Gate vein, the coal of which is 8 feet thick. Two main gangways are open in 1,300 yards. Only 4 breasts were working. The breaker at the colliery was accidentally destroyed by fire, in March last. The colliery discontinued operation since. 40 persons were employed in and about the colliery when in operation. 12 mine wagons and 6 mules were used. 1,400 yards of track is used. Monthly shipments, 1,000 tons. Value of improvements, $14,000. No accidents occurred during the year. 3 engines (75-horse) with 4 steam boilers are used.

THOMASTON SLOPE COLLIERY, NO. 1.—*Thomas Shollenburg, Operator.*

This colliery is situated at Thomaston, on the estate of the P. and R. R. R. Co. It is in operation one year. It consists of a double track slope, sunk on the Crosby seam 280 yards deep, on a 43° north dip. At present nothing else is doing than extending the west gangway to meet the east gangway of the No. 2 Slope; this gangway is protected for the use of a safe ingress and egress for the workmen. At present 24 hands are employed.

Ventilation is produced by a 40-horse steam fan, located at the Thomaston Slope Colliery, and is conducted in a practicable manner to supply air to this slope workings. Five hundred yards of gangway is open; extending gangway is the only work doing at this time. The condition of the mine is quite satisfactory.

THOMASTON SLOPE COLLIERY, NO. 2.—*William Kendrick, Esq., Operator.*

This colliery is situated at Thomaston, upon the estate of the P. and R. R. R. Co. It has been———years in operation. It consists of a double track slope, sunk 280 yards deep, on the north dip of the Crosby vein, on an angle of 43°. The Church vein is opened by a tunnel 86 yards long, driven northward; the Daniel vein lies 94 yards south of the Crosby vein. A tunnel is in progress to open the Daniel vein, and also to open the Skidmore vein. The coal in these seams runs from 5 to 12 feet thick.

Ventilation is produced by a 40-horse steam fan, practically conducted in spits into and out of each panel, and is one of the best ventilated mines in the district.

Four gangways are open 868 yards in length, working 16 breasts, shutes and headings, with 78 men employed. The character of the work done is considered safe. December 4, the outside temperature was 40° and inside 45°. Barometer outside was 29¼, and inside 29 8-10 inches. 31,924 cubit feet of air was supplied per minute; this result was quite satisfactory.

Five steam engines=240-horse are in use, and 12 good steam boilers with all the necessary equipments are in good condition. Twenty-six slope wagons, 13 mules and 2,000 yards of outside and 1,642 yards of inside track is used=3,642 yards. 78 inside and 68 outside hands are employed=146. Monthly shipments=2,500 tons. Value of improvements $——.

HECKSCHERVILLE SLOPE COLLIERY.—*John Wadlinger, Operator.*

This colliery is situated at Heckscherville, and has been in operation some years. It consists of a double track slope, sunk 300 yards deep on the Crosby vein, on an angle of 60° south, in 2 lifts. A tunnel run 67 yards south opens the Church vein. Work in this vein is at present suspended. A tunnel 119 yards long opens the Daniel vein from the Crosby gangway. The Daniel seam is 24 feet thick. The Leller veins are opened by a slope sunk 100 yards deep. The rock strata is only 16 yards thick.

Four gangways are open, working 18 breasts, etc., employing 67 hands, and 35 hands outside. The mine is in good condition.

Ventilation is produced by a 40-horse fan, which is conducted in a practical and satisfactory manner. December 5 the temperature was 40° outside, and 46° inside. The barometer outside was 29 2-10, and inside 29¼ inches. The quantity of air supplied was 14,762 cubic feet per minute. Thirty-six wagons and 8 mules are in use; 101 hands employed; 1,880 yards track laid; 14,762 cubic feet of air supplied.

Six engines=426-horse power, with 20 good steam boilers, with all their equipments, are in proper condition.

ANTHRACITE COLLIERY.—*Augustus Raab, Operator.*

This colliery is situated north of Tamaqua, upon the estate of the Lehigh Coal and Navigation Co. It consists of a drift opening on the south side of the C. vein; dips south on an angle of 80° in the lower lift, where the coal is 7 feet thick, while in the counter gangway the dip is 60° and the coal 20 feet thick. The mine, for the most part, is idle for the year. Ventilation is produced by natural means. One 25-horse engine is used at the breaker, with 3 boilers. Their condition is not known. Thirty-two hands are employed; 1,200 yards of track are used. Monthly shipments, 700 tons. Value of improvements, $14,000. Three visits were made=108 miles.

BULL RUN COLLIERY, (TUNNEL NO. 10.)—*Lehigh Coal and Navigation Co., Operators.*

This colliery is situated east of Tamaqua, on the estate of this company. It consists of a tunnel opening 331 yards north to the E vein. This tunnel level is worked out, but a slope is sunk at the face of the tunnel, on the E vein, 70 yards deep. The vein dips 40° south. Both gangways are open 671 yards, working 17 breasts, gangways, schutes and headings, the character of which is considered a safe operation. The coal is 50 feet thick. The west gangway is open 750 yards, working 18 breasts, etc. An outlet for men and mules is open on the west side. A pump slope is also sunk 80 yards west of the coal slope, and a trial slope is now sinking to prove the depth of the basin. One hundred and seven persons are employed in this mine. There are two gangways, working 35 breasts. Mr. E. T. Jones is entitled to credit for his skill and industry.

Ventilation is produced by a 20-horse fan, and is conducted upon a practical system, giving entire satisfaction. The quantum of air supplied per month is 15,167 cubic feet.

Five steam engines are used=440 horse, and twelve steam boilers with all their appointments are in good condition; 204 hands are employed; 94 mine wagons and 12 mules are used, with two locomotives; 60 tenant houses occupied by 60 families; 4,000 yards of track is used of 30 and 40 lb. rail; monthly shipment 9,500 tons; value of improvements $——; outside temperature was 49°, inside 60°; barometer outside 29 and inside 29.3 inches. The indications were such that very little fire-damp existed in the mine.

TAYLORVILLE COLLIERY.—*Thomas Schollenberg, Operator.*

This colliery is situated at the extreme western end of Glen Carbon basin, upon the estate of the P. & R. R. Co. It consists of a double track slope sunk 300 yards deep on the Daniel vein on an angle of 69° south. Two lifts are worked in this mine in four gangways = 975 yards, working 35 breasts, schutes and headings, employing 100 hands. The coal is six feet thick.

WEST PINE KNOT COLLIERY.—*William Kendrick, Esq., Operator.*

The colliery is situated west of New Castle, upon the estate of the P. & R. R. Co. It consists of a double track slope 235 yards deep on the E vein, on an angle of 65° south. Mining is suspended for the present. Some extensive repairs are going on, and preparing to sink a new slope. Thirty-eight persons are employed in the mine on this occasion. When these contemplated improvements are completed it will be amongst the first-class collieries of our district.

Four steam engines are in use = 595 horse, and 13 good steam boilers, with all their appointments are in good condition.

Ventilation is produced by a 25-horse fan, but in consequence of sinking the new lift its use had to be dispensed with and natural ventilation substituted.

LITTLE TRACY COLLIERY, (SMALL.)—*Charles Conner, Operator.*

This colliery is situated north of Pottsville, upon the estate of the P. and R. R. R. Co. It consists of a small drift opening on the little Tracy vein. Its gangway is 350 yards in length. Sort of work doing is robbing out the present level; 12 persons are employed. Value of improvements some $400.

NORTH AMERICA COLLIERY, (SMALL.)—*William Mead, Operator.*

This colliery is situated north of Pottsville, upon the estate——. It consists of a tunnel open on the Lewis vein, south dip 34°. The coal is seven feet thick. Six persons are employed. The improvements are valued at some $500. Ventilation is produced by natural means.

NORTH AMERICA COLLIERY, NO. 2, (SMALL, NEW,)—*Faust & Bro., Operators.*

This colliery is situated north of Pottsville, upon the estate of the P. and R. R. R. Co. It consists of a slope sunk on the Tracy vein 25 yards deep. The gangway is open 60 yards in. A tunnel 15 yards long opens the north dip. Coal in both dips is four feet thick. The colliery will become one of considerable importance when fully developed. Twelve hands are employed. Value of improvements is estimated at $3,000. Monthly shipments 40 tons.

NORTH AMERICA COLLIERY, NO. 3.—*John Reese, Operator.*

This mine is situated on the P. and R. R. R. Co.'s estate. It consists of a drift open on the Palmer vein; 280 yards of gangway. The vein is small. The coal is good and three feet thick. The character of work done is safe.

PALMER COLLIERY (SMALL)—*Joseph Seitzinger, Operator.*

This colliery consists of a small slope sunk on the Palmer vein 36 yards deep. The coal is four feet thick, on a dip of 40°. The operation is a new one and needs no extended report on its present condition, further than all work done is satisfactory. Some ten persons are employed.

TRACY VEIN COLLIERY.—*William Clark, Operator.*

This colliery consists of a slope sunk 50 yards deep on the Little Tracy vein. The coal is five feet thick. This is a small land-sale colliery. The work done is safe. Ventilation is produced by natural means. A full description of the colliery is unnecessary, further than the mine is in a safe condition. Value of improvements is $2,000.

EAST MINE COLLIERY, (SMALL.)—*George Seibert, Operator.*

The colliery consists of a slope, sunk on the Lewis vein, 90 yards deep to the water level. The coal is 5 feet thick. The character of work is safe. At present the place is idle. When in operation it gives employment to some 12 hands.

TUSCARORA COLLIERY, (SMALL.)—*John Sullivan, Operator.*

This colliery consists of a drift, opening on the north dip of the Diamond vein, the seam dips 60° south. One hundred and eighty yards of gangway are open. The seam is 8 feet thick. Mining is not considered a safe operation under the present condition of things. Extensions of any sort is discontinued. When in full operation it gives employment to 14 hands. Any further comment is needless

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KENTUCKY COLLIERY.—*Shall & Donohoe, Operators.*

This colliery is situated west of Tuscarora, on the estate of Philadelphia and Reading railroad company and Kentucky Bank tract. The western section of the mine is worked upon the Kentucky tract, and the eastern section upon the Philadelphia and Reading railroad company's tract. It consists of a double track slope, sunk 161 yards deep on the E vein, dip 60° south. The character of work doing is extracting loose coal and robing pillars. Both gangways end in faulty rock dykes. One thousand six hundred and fifty yards of gangways are open at present. The operators and owners refuse extending the excavations through these rock faults.

Ventilation is produced by a 20 horse fan, and is practically applied, supplying a sufficient quantum of air.

December 12, the temperature outside was 35° and inside 56°. The barometer 29¼ outside and 29 8-10th inches inside. The ventilation was safe. Little or no fire-damp existed; 9,530 cubic feet of air had been supplied per minute.

Five steam engines are in use=205 horse, and eleven good steam boilers, which with all their appointments are in good condition. Forty wagons and ten mules are used; 3,000 yards of track are used; 54 hands are employed in the colliery. I find the colliery managed properly with regard to health and safety and economy.

PEACH ORCHARD COLLIERY.—*B. Rowebotham, Operator.*

The colliery is situated West of Tuscarora, upon the estate of G. Bast and the Kentucky Bank tract. It consists of a single track slope, sunk 65 yards deep, on the Peach Mountain vein, on a dip 78° south. 462 yards of gangway is open, the extension of which ceased in consequence of a fault in the seam. Mining is therefore confined to extracting the loose coal and pillar-robbing. Ventilation is produced by natural means; the supply was ordinarily sufficient and the mine in good condition. 10 persons were employed inside and 16 outside.

Two engines are in use=60-horse power, and 3 steam boilers, whose condition I consider unsafe. Safe means for egress and ingress is permanently established. The operator discontinued extending gangways for the present, but the mines are in a fit condition to proceed when it is decided to do so.

BURKVILLE COILLERY.—*William Kendrick, Operator.*

This colliery is situated west of Tamaqua, on the estate of the P. and R. R. R. Co. It has been many years in operation. It consists of a double track slope, sunk 270 yards deep on the Holmes or F vein, dipping 45° south. The coal is 10 feet thick. 100 yards east of the slope bottom, a tunnel, 87 yards north, opens the E vein. The seam is 30 feet thick, with 850 yards of gangways open on it. A steam pump of — horse power has been erected on the Tucker (old) works, in connection with this colliery, for the double purpose of draining both places.

STATISTICS *relating to Pottsville District collieries, for the year ending December* 31, *A. D.* 1878.

NAMES OF COLLIERIES.	POST-OFFICE ADDRESS.	Years in operation	Visits to collieries	Miles traveled	Men employed	Breasts	Planes	Gravity	Slopes	Drifts	Length gangway in yards.	Breasts	Horse-power of fans	Furnaces	Outlets	Ventilation	Seams worked.	Dip of seam south	Dip of seam north
Butler	New Phila	36	3		53				1		650	8			1	Good	1	South	
Eagle Hill	New Phila	15			197	1	7	8	1	1	740	20	20			Good	1	South	
Norwegian	Pottsville	36			82				3	1	767	17	10				1	South	North
Glen Carbon	Glen Carbon	20			328	2	3	5	2		1,280	12	40			Good	3	South	
Feeder Dam	Port Carbon	10			95				1		1,575	12				Good	1	South	
Commercial	New Phila	17		98	144		2	2	2		1,[illegible]	14			1	Good	3	South	
East Mine	Pottsville	[illegible]	10	80	88					1	100	4			1		1	South	
St. Clair shaft	St. Clair	16	6	48	253	3	9	12		1	5,340	25	35		1	Good	2	South	
Coaldale	Summit Hill	10	4	176	214		1	1	1		1,700	25			1	Good	2	South	
E. Pine Knot	New Castle	17	4	50	279	1	5	6	2		1,700	28	25		1	Good	1	South	
Black Heath	St. Clair	10	3	27	16					1	400	3			1	Good	1	South	
Manchester	St. Clair	30	3	25	57				2		250	7			1	Good	2	South	
Spruce Forest	St. Clair	14	3	30	29					1	200				1	Good	1	South	
Ravendale	Port Carbon	14	5	11	171	1	5	6	1		900	9	10		1	Good	1	South	
Glentworth	Port Carbon	[illegible]	[illegible]	[illegible]	75				2		900	9	10		1	Good	1	South	
New Castle	New Castle	12	3	30	29					1	200	4			1	Good	1	South	
Greenberry	New Castle	12	4	15	14				1		250	3			1	Good	1	South	
Bullock	Minersville	4	4	12	12					2	1,450			1	1	Good	1	South	
Glen Dower	Minersville	15	6	144	100				2		2,050	15	50 / 25		1	Good	2	South	
Eagle	St. Clair	33	3	24	192	1	6	7	2		17,000	9		2	1	Good	2	South	
Tamaqua	Tamaqua	19	7	252	52		2	2		1	7,400		20		1	Good	2		North
Forestville	Minersville	30	4	64	105				1		2,000	10		1	1	Good	1	South	
Monitor	St. [illegible]	14	8	64	55						1,200	6	6				1	South	North
Phœnix, No. 4	Mine [illegible]	3	3	36	17							2				Good	1	South	
Diamond, No. 2	Pottsville	3		20	10							4				Good	1	South	
East Mine shafts	Pottsville	2	4	32	100	1	1	2	1				10 / 8 / 10			Good	2	South	
Hickory slope	St. Clair		3	24	91				1								1	South	
Mine Hill Gap	Minersville		3	30	240	1		1	2		1[illegible]				1	Good	1	South	
Swift Creek	Tuscarora		2	144	60				1		600		40			Good	1		South

Alaska	Tamaqua	23	2	72	82					2	2,100	2			1	Good	2	South		
Wabash	Tamaqua	3	2	64	144				1		1,500	4	25		1	Good	3		North	
Ravendale	Port Carbon	37	3	96	40				1		1,350	4			1	Good	1	South		
Newkirk	Tamaqua	30	6	204	118				2		3,500	5	20		1	Good	5	South		
Mammoth Vein	New Phila	32	3	72	90		1	1	1		2,350	7	10		1	Good	2	South		
Pine Forest shaft,	St. Clair	11	5	42	215	1	9	10		1	1,970	33	25		1	Good	3	South		
Hickory shaft	St. Clair	4	6	48	385					1	1,830	47	30		1	Good	2	South		
Greenwood	Tamaqua	8	4	160	82		2	2	1		1,130			1	1	Good	3	South		
Greenwood, No.2,	Tamaqua	8	4	160	135				1		1,520	10	15 / 15		1	Good	2	South		
Beechwood	Pottsville	38	10	80	336	1	12	13	1		2,800	54	30		1	Good	2	South		
York Farm	Pottsville	3	2	6	20				1		550	4			1	Good	1	South		
J. Rich	Pottsville	29	2	6	12				1		400	4			1	Good	1	South	North	
Sharp Mountain	Pottsville	5	2	4	12				1		540	2			1	Good	2		North	
Tamaqua drift	Tamaqua	3	3	108	24					1	780	3		1	1	Good	2		North	
Yorkville	Pottsville	5	2	8	14				2	1	350	4		1	1	Good	2		North	
Lambert	New Phila	29	3	36	82		1	1	1		1,180	15	10		1	Good	1	South		
Gate Vein shaft	New Phila	10	2	24	40					1	1,300	4	6		1	Good	1	South		
Thomaston shaft	Minersville	15	3	48	144					1	1,642	16	40		1	Good	2		North	
Thomaston slope,	Minersville	3	3	48	46	1	2	3	1		500		40		1	Good	2		North	
Heckscherville	Minersville	30	4	64	101				1		840	16	40		1	Good	3	South		
Anthracite	Tamaqua	20	3	108	32					2	500				1	Good	2	South		
Bull Run	Tamaqua	10	5	200	204				2		1,421	35	20		1	Good	1	South		
Taylorville	Minersville	10	4	88	190				1		945	35	40		1	Good	1	South		
West Pine Knot	Minersville	25	3	36	38				1		600		25		1	Good	2	South		
Tracy	Pottsville	5	3	10	12					1	350				1	Good	1	South		
North America	Pottsville	5	2	8	6					1	350				1	Good	1	South		
N. America, No.2,	Pottsville	4	2	6	12				1		60	2			1	Good	1	South		
N. America, No.3,	Pottsville	4	3	9	10					1	280	2			1	Good	1	South		
Palmer	Minersville	6	3	8	10				1		60				1	Good	1	South		
Big Tracy	Pottsville	5	3	8	8				1		60				1	Good	1	South		
East drift	Pottsville	3	3	8	10				1		70				1	Good	1	South		
Tuscarora	Tuscarora	2	2	46	14					1	280				1	Good	1	South		
Kentucky	Tuscarora	12	3	69	54		1	1	1		1,650		20		1	Good	1	South		
Peach Orchard	Tuscarora	3	3	46	26				1		462				1	Good	1	South		
Buckville	Tamaqua	36	4	120	156						1,175		20		1	Good	3	South		
Live Oak	Minersville	19	8	80	118				1			5	20		1	Good	1	South		
White Oak	New Castle	1	2	16	16				1		60				1	Good	1	South		
Oakdale	Minersville	16	2	40	175				1	2	3,200	9	40		2		2		North	
Holohan drift	New Phila	1	1	16	12					1	250	2			1	Good	1	South		
Kaska William	Middleport	28	1	18	6															
Palm	Middleport	1	1	16	6															

STATISTICS *relating to Pottsville District collieries—Continued.*

NAMES. OF COLLIERIES.	POST OFFICE ADDRESS.	No. of engines.	Horse-power.	Boilers.	Temp'ture outside, degrees.	Temp'ture inside, degrees.	Barom. outside	Barom. inside.	Sort of gas.	Yards of track.	No. of mules.	No of wagons.	Tenements.	Families	Monthly shipments in tons of 2,240 lbs.	Estim'd value of improvements.
Butler	New Phila	2	70	8					Fire	440	2	20			500	$5,000
Eagle Hill	New Phila	6	206	14	78	70	28½	29	Fire	3,000	8	38				
Norwegian	Pottsville	5	290	13	76	78	28.7	28.7	Fire	1,000	8	23	12	19	3,500	50,000
Glen Carbon	Glen Carbon	7	442	18	72	62	28	28	Fire	1,400	12	50	58	58	8,000	175,000
Feeder Dam	Port Carbon	4	104	8	70	78	28	28½	Fire	1,492	5	24			1,700	50,000
Commercial	New Phila	4	410	14	54	64	29	28½	Fire	1,690	9	40	14	8	3,000	70,000
East Mine	Pottsville								Fire	130	1	2			20	600
St. Clair shaft	St. Clair	7	756	13	60	74	29.8	29.6	Fire	6,584	35	112			8,000	
Coaldale	Summit Hill	6	1,180	13					Fire	6,584	41	120			9,000	300,000
E. Pine Knot	New Castle	7	745	22	68	64	29	29.4	Fire	5,050	28	62	52	39	9,000	300,000
Black Heath	St. Clair	1	10	2	62	70	28½	28.7	Fire	1,000	2	6			600	1,000
Manchester	St. Clair	1	50	3	80	66	28	28½	Fire	400	2	6			468	1,000
Spruce Forest	St. Clair	3	100	6					Fire	1,490	4	12	4	1	3,000	40,000
Ravendale	Port Carbon	4	160	10	64	60	29.7	29.8	Fire	2,400	12	40			6,000	70,000
Glentworth	Port Carbon	6	205	8	62	70	29½	29.8	Fire	2,000	5	20	16	10	7,000	60,000
New Castle	New Castle	1	30	3					Fire	300	2	10			New	50,000
Greenbury	New Castle	2	30	3					Fire	500	3	10			New	20,000
Bullock	Minersville								Fire	1,100	2	7			700	4,000
Glen Dower	Minersville	9	1,025	23	58	52	28½	29.2	Fire	8,350	19	85	2	1	5,000	300,000
Eagle	St. Clair	6	255	13	66	66	28½	28½	Fire	19,660	16	80	30	30	8,000	
Tamaqua	Tamaqua	6	235	13	80	68	29	29.4	Fire	8,000	14	47			1,800	250,000
Forestville	Minersville	3	76	6	46	56	28.8	28½	Fire	3,000	5	38			3,500	40,000
Monitor	St. Clair	3	86	5	79	74	28.7	28.2	Fire	2,800	8	20	3	2	3,500	30,000
Phœnix, No. 4	Minersville								Fire	400	2	5			400	6,000
Diamond, No. 2	Pottsville	1	10	1					Fire	400	2	6			500	8,000
East Mine shafts	Pottsville	7	498	14					Fire	1,600	2	2	20	20	Used at wks	
Hickory slope	St. Clair	3	145	4	78	76	28.6	29	Fire	2,600	2	21	4	4	3,000	10,000
Mine Hill Gap	Minersville	9	482	16					Fire		12	42	12	12	Idle.	150,000
Swift Creek	Tuscarora	2	145	8					Fire	800	4	20			Idle.	50,000
Alaska	Tamaqua	3	55	5					Fire	2,800	15	42			5,000	50,000
Wabash	Tamaqua	9	604	17	50	62	29	29½	Fire	1,621	14	40	13	12	6,000	250,000
Ravendale	Port Carbon	2	50	3	60	68	28.8	28.9	Fire	2,008	6	16			2,000	20,000

Newkirk	Tamaqua	5	430	19	54	64	29	29.3	Fire	4,000	14	50			4,000	40,000
Mammoth Vein	New Phila.	5	180	10					Fire	4,000	16	60	8	6	3,500	50,000
Pine Forest shaft	St. Clair	6	855	29	50	62	29.3	29.7	Fire	3,225	16	72	46	46	10,000	
Hickory shaft	St. Clair	7	740	20					Fire	2,000	28	100			20,000	100,600
Greenwood	Tamaqua	4	164	7	36	62	28.8	29	Fire	1,300	13	40	2	2	4,000	
Greenwood, No. 2	Tamaqua	7	857	21	40	65	28.3	29	Fire	3,380	25	60	2	2	5,000	
Beechwood	Pottsville	6	226	12	40	70	29½	29	Fire	3,000	22	90	15	15	10,000	
York Farm	Pottsville	1	20	2					Fire	600	2	6			2,000	
J. Rich	Pottsville	1	20	2					Fire	450	1	4	2	2	2,000	8,000
Sharp Mountain	Pottsville	2	25	1					Fire	900	2	8			7,440	
Tamaqua drift	Tamaqua								Fire	900	3	17			3,000	
Yorkville	Pottsville								Fire	600	2	8			200	
Lambert	New Phila.	3	85	7					Fire	2,000	6	30	10	10	4,000	30,000
Gate Vein shaft	New Phila.	3	95	4					Fire	2,000	6	30			1,000	
Thomaston shaft	Minersville	5	240	12	40	45	29.7	29.8	Fire	3,642	13	46	200	200	2,500	
Thomaston slope	Minersville	2	100	6					Fire	600	4	20	200	200		
Heckscherville	Minersville	6	426	20	40	46	29.2	29½	Fire	1,880	8	36	130	130		300,000
Anthracite	Tamaqua	1	25	3					Fire	700	2	12				14,000
Bull Run	Tamaqua	5	444	12	49	60	29	29.3	Fire	4,000	12	94	60	60		
Taylorville	Minersville	3	200	10					Fire							
West Pine Knot	Minersville															
Tracy	Pottsville									450	1	4				400
North America	Pottsville									450	1	6				500
N. America, No. 2	Pottsville									350	2	4				3,000
N. America, No. 3	Pottsville									340	2	6				500
Palmer	Minersville									180	2	4				300
Big Tracy	Pottsville									200	2	4				200
East drift	Pottsville									220	2	6				350
Tuscarora	Tuscarora								Fire	320	2	6				
Kentucky	Tuscarora	5	205	11	55	56	29½	29.8	Fire	3,000	11	40				150,000
Peach Orchard	Tuscarora	2	60	3					Fire	595	3	7				
Buckville	Tamaqua	5	290	12					Fire							
Live Oak	Minersville	4	150	9	74	64	29	29.2	Fire	2,000	5	32	10	10		75,000
White Oak	New Castle								Fire	300						
Oakdale	Minersville	8	580	15	80	74	28½	28.8	Fire	2,600	10	40	70	70		
Holohan drift	New Phila.								Fire	300	2	10				
Kaska William	Middleport								Scree'gs		2	4	10	10		
Palm	Middleport								Scree'gs		2	4				

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REPORT

OF THE

INSPECTOR OF MINES OF THE SECOND OR ASHLAND DISTRICT, FOR 1872.

His Excellency, JOHN F. HARTRANFT,

Governor of the Commonwealth of Pennsylvania:

SIR:—In compliance with the requirements of law, I have the honor to herewith submit my annual report of the condition and character of the collieries in my district, the number and character of the casualties that have occurred during the year, which I regret, is so large as forty-two deaths—only four deaths less than last year. The largely increased force of persons employed in these mines this year and the increased tonnage of coal, will, in a great measure, account for this mortality, when it is a known fact that hundreds of our modern miners and mine hands, with impetuous youths, are employed to do the work of practical experienced persons. Many of these collieries are profuse in generating fire-damp, and nearly all have high dipping and thick coal seams. By these conditions the dangers are multiplied, but the force of necessity bedims dangers, and consequently, casualties result from numberless causes. Even the most vigilant cannot escape. The deaths that occurred were generally single cases, and the verdicts rendered by thirty-nine juries is that all came to their deaths by mere accident. I am pleased to inform your Excellency that the condition of the mines and mine ventilation is greatly improved, and is upon the part of all managers and mine bosses receiving encouraging attention. The dread of the execution of the law by the Inspector of mines is passing away, and a desire to comply with its requirements is gaining friends. I am not without hope that a decline in casualties will result from the precautionary measures adopted by our managers and a little more caution exercised by the miners, who often not only endanger their own lives, but the lives of others, by their hasty acts. Our duties may be inconvenient and hazardous, but the consciousness of having discharged it with fidelity and to the best of our ability nerves us for the good work, asking the co-operation of mine bosses and miners and those employed in the mines to aid by such means as is at their control to lessen the causes of death and misery resulting from their negligent acts.

ASHLAND DISTRICT.

LIST *of names of persons killed, or who died of their injuries, in the Second or Ashland District during the year ending December* 31, *A. D.* 1872.

Date.	Names of person killed.	Names of the collieries.	Widows....	Orphans....	Character of casualties.
Jan. 1.....	A miner at.....	Honey Brook..	.....	.....	Killed in the mines by a fall of coal.
9.....	Abraham King.. ..... 2 persons.	Lentz & Bowman..	1	.....	Killed—scull broken by a fall of coal.
March 7.....	Patrick Ballard	Focht & Whittaker	1	.....	Killed by a fall of coal.
21.....	Hugh O'Hara	Tunnel.....	.....	.....	Killed by breaking of the slope chain.
23.....	Owen Cannon.	Wm. Penn...	1	3	Killed by a fall of coal.
23.....	Thomas M'Closkey.. ..... 4 persons.	Focht & Whittaker	1	1	Killed by the slope cage falling on him.
April 1.....	Thomas A. Davis.....	Primrose.....	1	1	Killed by a fall of coal.
6.....	John Harber	Indian Ridge.....	.....	.....	Killed by a fall of coal.
17.....	Jenkins Crannage.....	Locust Dale..	.....	.....	Died—being burnt by an explosion of gas.
17.....	George Crannage.....	Locust Dale.	.....	.....	Died—being burnt by an explosion of gas.
17.....	Thomas Hodjins	Honey Brook.....	1	4	Died suddenly while at work.
27.....	John D. Bowen..... ..... 6 persons.	Locust Dale.	1	2	Killed by the discharge of a blast.
May 3.....	Philip Rilley	Honey Brook..	1	2	Killed by a fall of coal.
19.....	Patrick Haley	Lehigh, No. 3..	1	6	Died—being burnt by discharge of powder.
29.....	Michael Corcoran..... .... 3 persons.	Locust Run.....	1	4	Killed—run over on the dirt plane.
June 1.....	Patrick Narrey	Girardsville.....	....	.....	Killed in the revolving rollers
1.....	Michael Clarey	Indian Ridge	1	2	Died—injured by a fall of coal.
1.....	Philip Winter	Kohinoor	1	4	Killed by a fall of coal.
6....	John M'Quade	Kohinoor	.....	.....	Killed by falling down the shaft.
7.....	Daniel O'Connor.....	Gilberton	.....	.....	Killed by a fall of coal.
10.....	Paul O'Neil..	Locust Dale.....	1	6	Killed by the fall of a trestle work.
13. ...	John Crozier	Gilberton	.....	.....	Killed by the pumps in the slope.
13.....	John Taylor.....	Bear Run..	1	4	Mortally burned by fire-damp—died.
13.....	Patrick Roach	West Lehigh..	1	4	Killed by a fall of coal.
13	George Greggor.....	Boston Run.....	.....	....	Killed by a coal wagon falling on him.
19.....	John Weeks, (boy,) ..... 10 persons.	Trenton.....	....	.....	Killed in the revolving rollers.

ASHLAND DISTRICT—*Continued.*

Date.	Names of persons killed.	Names of the collieries.	Widows.	Orphans.	Character of casualties.
July 1	Patrick Kelly	Locust Run	.....	.....	Killed by a wagon crushing him against slope collars.
16	Anthony M'Anolty	Ellengowen	1	.....	Killed by falling off the slope wagon.
20	Thomas Davidson.	Boston Run.	1	.....	Killed by falling off the slope wagon.
24	John Higgins. 4 persons.	West Lehigh	1	.....	Killed by a fall of coal.
Aug. 8	John Walsh	Kohinoor	.....	.....	Killed—fell off the cage into the shaft.
8	Richard Fitzpatrick	Elmwood	.....	.....	Died from being burnt by powder.
22	Martin Whalen	Lehigh, No. 3	.....	.....	Killed—the truck tilting over in the slope.
22	John Huffey. 4 persons.	Hazle Dell	1	4	Killed—the truck tilting over in the slope.
Sept. 20	Michael M'Glaughlin	Gilberton	1	3	Died from effects of a fall of rocks.
20	Jos. Waranouskie 2 persons.	Boston Run.	....	.....	Killed—scull crushed while coupling wagons.
Oct. 7	Conrad Hostel	Hill & Harris	1	4	Killed by a fall of coal.
7	Dennis Daugherty 2 persons.	Union, E. Bast	1	3	Killed by a fall of coal.
Nov. 8	Owen King	Raven Run	1	4	Killed while descending the slope.
8	Patrick Kirregan	Lost Creek	1	2	Died—arm cut off by a fall of coal, Oct. 25.
27	Timothy Collins . 3 persons.	Lentz & Bowman	1	4	Killed by a fall of coal.
Dec. 13	Benjamin Hill 1 person.	Lentz & Bowman	.....	.....	Killed in the act of spraging wagons.

Forty-two deaths this year against forty-six last year, decrease four. Thirty-three of this number had been killed, and nine died subsequently of the severe injuries they had received, leaving twenty-five widows and sixty-eight orphans; a number of these causalties are the result of carelessness, hurry and ignorance, a matter which cannot be too severely condemned—blameable upon the part of the employed themselves.

ASHLAND DISTRICT.

List of names of persons maimed and injured in and about these mines during the year ending December 31, A. D. 1872.

Date.	Names of persons injured.	Names of the collieries.	Remarks.
Feb. 9,	David Bowman..	Lentz & Bowman	Leg broken in the mines.
Mar. 15,	Thos. Conners....	Plank Ridge.....	Severely injured by a fall of coal.
18,	Wm. M'Keon....	Plank Ridge.....	Severely injured by a fall of coal.
18,	John Hartman...	Plank Ridge.....	Foot broken by a fall of coal.
Apr. 4,	John Williams...	Locust Dale.....	Severely burnt by gas.
4,	George Bevan....	Locust Dale.....	Severely burnt by gas.
4,	Andrew Stitzer.	Locust Dale.....	Severely burnt by gas.
4,	John Monroe.....	Locust Dale.....	Severely burnt by gas.
4,	James Macks.....	Locust Dale.....	Severely burnt by gas.
4,	Frank Branan ...	Locust Dale.....	Severely burnt by gas.
4,	Enoch Thomas...	Locust Dale.....	Severely burnt by gas.
4,	James Madden...	Locust Dale.....	Severely burnt by gas.
4,	Jenk's Granage..	Locust Dale.....	Mortally burnt by gas—died.
4,	Geo. Granage.....	Locust Dale.....	Mortally burnt by gas—died.
6,	Michael Keller...	Union..	Severely burnt by powder.
15,	Elias Feler.....	Hill and Harris..	Severely burnt by gas.
15,	James Duffy	Turkey Run	Severely injured by a fall of coal.
27,	The fireman.....	Hillside.....	Leg broken—fell over a bank.
29,	Jas. Carpenter ...	Hillside.....	Leg broken—fell off a building.
May 1,	John M'Cafferty,	Honey Brook.....	Severely injured by wagons.
6,	James Golan	Union.....	Leg broken by a fall of coal.
10,	John Richards...	Tunnel Ridge.....	Severely injured—fell down a manway.
12,	David Reese.....	Primrose	Severely injured by a fall of coal.
18,	Samps. Cooch.....	Wm. Penn.....	Leg broken by a fall of coal.
20,	Conrad Silbach...	Plank Ridge.....	Head severely cut by a fall of coal.
21,	Austin Lyons.....	Shenandoah.....	Arm broken by a fall of coal.
21,	Thomas Hughes,	Lehigh, No. 3.....	Head severely cut—fell down a schute.
21,	Patrick Devitt....	Shenandoah city	Knee severely cut by a fall of coal.
21,	Patrick Hannity,	Plank Ridge	Foot cut off by a fall of coal.
25,	Michael Cleary...	Indian Ridge.....	Arms broken by a fall of coal.
25,	John Taylor.....	Wiggans...	Mortally burned by gas. Died June 1.
June 3,	John Moore.....	Tunnel Ridge.....	Severely crushed by mine wagons.
3,	A boy..	Girardsville.....	Head severely cut by a fall of slate.
3,	A miner.....	Girardsville.. ...	Thigh broken by a fall of coal.
5,	John Devany.....	Girardsville.....	Mortally injured.
8,	A miner.....	Tunnel Ridge....	Leg broken by a fall of coal.
8,	Charles Carroll...	Hill & Harris.....	Fingers cut off by wagons.
12,	Henry Wootten..	Lentz & Bowman	Head severely cut by a fall of coal.
12,	Pat. Nary, boy ..	Wm. Penn.....	Eyes injured by a blast.
19,	B. L. Eschelman	Preston, No. 2.....	Head cut by a fall of slate.
July 6,	Samuel Tregoe..	Boston Run	Back crushed by a fall of coal.
8,	Pat'k Monaghan	Plank Ridge	Severely injured by a fall of coal.
8,	Patrick Ruddy...	Lost Creek.....	Head injured by a fall of coal.
8,	Josiah Gill	Plank Ridge	Leg broken by a fall of coal.
10,	James Jordan.....	Tunnel Ridge.....	Leg broken by a wagon.
13,	Thomas Galvin...	Colorado	Legs broken by a fall of coal.
13,	Daniel Hughes...	Turkey Run	Head cut by a fall of coal.
19,	Wm. Hartney.....	Tunnel	Thigh broken—crushed by a wagon.
20,	Israel Rodgers ...	Plank Ridge	Slightly injured by a fall of coal.
24,	Thomas Bane.....	St. Nicholas.....	Severely injured by falling off the cage.
24,	Hugh Evans	St. Nicholas..	Severely injured by falling off the cage.
24,	James Walsh	St. Nicholas [ker	Severely injured by falling off the cage.
24,	A miner.....	Focht & Whitta-	Leg broken by a fall of coal.
25,	John Higgins.....	West Lehigh.....	Severely crushed by a fall of coal.
26,	Thos. Richards...	Tunnel Ridge.....	Severely injured by a blast.
26,	William Bale	Wiggan.	Leg broken by a fall of coal.
29,	Henry Hunt	Lentz & Bowman	Severely injured by a fall of timbers.
Aug. 7,	T. Goldsworthy..	Glendon.....	Collar bone broken by wagons.
8,	Albert Dennis....	Elmwood	Severely injured in the mines.
8,	Rich. Fitzpatrick	Elmwood	Arm cut off in the mine.
8,	Matthew Schue..	Hillside.....	Head cut by a fall of coal.
14,	James Valance...	Copley	Severely injured by a fall of coal.
19,	Richard Bryant..	Furnace	Arm broken by a blast.

ASHLAND DISTRICT—*Continued.*

Date.	Names of persons injured.	Names of the collieries.	Remarks.
Aug. 22,	2 men.	Lehigh, No. 3....	Severely injured—fell off the slope truck
22,	Jas. Garraway....	Gilberton.....	Body crushed by a fall of coal.
23,	C. Meizeniger....	Cambrian..	Seve'ly inj'd by breaking of slope chain.
24,	John Minchell ...	Lehigh, No. 3....	Head and back crushed by a fall of coal.
24,	Richard Kneicht	Lehigh, No. 3....	Leg broken by a wagon.
24,	John M'Neal	Plank Ridge	Head seve'ly cut by discharge of a blast.
24,	Thos. Needham..	Plank Ridge.....	Hands seve'ly cut by discharge of a blast.
24,	D. Fitzgerrold....	Plank Ridge	Hands seve'ly cut by discharge of a blast.
24,	Thomas Youtz ...	Kohinoor.....	Back severely cut by a fall of coal.
26,	John Greener.....	Kohinoor.....	Hand cut off by a circular saw.
Sept. 4,	John Wilson	Boston Run..	Arm broken—fell down a schute.
12,	Wm. Morgan.....	Lentz & Bowman	Head severely injured by a fall of coal.
18,	J. Warrens.....	St. Nicholas.	Leg broken (amputated) by dirt car.
27,	James Stitzer.....	Keystone	Severely burnt by an explosion of gas.
Oct. 13,	J. Cunningham..	Girardville.....	Severely—fell into the slope.
21,	John Coalhouse..	Bowmans.	Leg broken—crushed by wagons.
Nov. 7,	A. Rowland..	Girardsville..	Leg broken by a fall of coal.
9,	A miner.	Lost Creek	Severely injured by a slope truck.
15,	John Wyle, boy..	Primrose.....	Arm cut off by the rollers.
27,	Chas. Reighter...	Kohinoor...	Severely injured by a fall of coal.
27,	John Mathews...	Plank Ridge	Severely injured by a fall of coal.
27,	B. Dillman....	Kohinoor.....	Severely injured by a circular saw.
27,	Patrick Jordan...	Lentz & Bowman	Leg broken in three places—fall of coal.
28,	Timothy Connell	Kohinoor.....	Mortally injured by a fall of coal—died.
Dec. 5,	Wm. Pooler.	Kohinoor.....	Eyes burnt by an explosion of powder.
5,	David Williams..	St. Nicholas	Severely burnt by explosion of powder.
5,	John Walsh.....	St. Nicholas.....	Leg broken—fell down a schute.
12,	David Lewis	Shoemaker's	Head severely cut by a fall of rocks.
12,	Frank Burkley...	Tunnel Ridge.....	Head severely cut by a fall of coal.
12,	Christian Foster..	Tunnel Ridge.....	Severely injured by a fall of coal.
12,	Christ. Post	Tunnel Ridge.....	Severely injured by a fall of coal.
12,	Pat. M'Anally ...	Mahanoy City....	Severely injured by a fall of coal.
12,	Patrick Ryan.....	Mahahoy City....	Severely injured by a fall of coal.
19,	Patrick Dillon....	East Mahanoy ...	Severely injured by a fall of coal.
19,	Wesley Yhoe.....	East Mahonoy ...	Foot crushed in rollers. Died Jan. 20, '73.
28,	Kene Mangan....	Ellengowen.. ...	Ribs broken—fell down the shaft.

99 persons were maimed and injured during the year, against 168 last year.

Coal tonnage for 1872 *was* 3,101,903.

No.	Names of collieries.	Location.	Land owners.	Names of operators.	Tons mined.
1	Wm. Penn.....	Shenandoah.....	P. R. C. and I. Co.	Wm. Kendrick.....	89,360
2	Indian Ridge..	Shenandoah.....	P. R. C. and I. Co.	Wm. Kendrick.....	80,560
3	Locust Dale....	Ashland	P. R. C. and I. Co.	S. C. Harris.	29,964
4	East Mahanoy	Mahanoy city.....	Delano Land Co....	Focht & Whittaker	56,606
5	Lehigh, No. 4..	Shenandoah.....	P. R. C. and I. Co.	Packer & Co.	.....
6	Knickerbock'r	Maple Dale.....	P. R. C. and I. Co.	Fowler & Co	45,596
7	M'Neal...	Maple Dale.....	P. R. C. and I. Co.	Wm. Kendrick.....	84,223
8	M'Neal, No. 2..	Maple Dale.....	P. R. C. and I. Co.	Wm. Kendrick.....	84,223
9	Barry, No. 3....	Maple Dale.....	P. R. C. and I. Co.	Wm. Kendrick.....	84,223
10	Primrose... ...	Mahanoy city.....	Caldwell and oth's	Nevills & Co.	52,213
11	Mahanoy City,	Mahanoy city.....	....	Romel, Hill & H'rris	101,289
12	St. Nicholas....	St. Nicholas..	....	J. Dennison & Co...	88,140
13	Delano...	Mahanoy city.....	L. V. R. R. Co.....	Gorman and others	15,013
14	Suffolk.....	St. Nicholas.. . ..	P. R. C. and I. Co.	Phillips & Son	49,080
15	Stanton	Gilberton	J. Gilbert.....	Miller & Maize	52,989
16	Lawrence..... ..	Gilberton	J. Gilbert.	J. Lawrence & Co..	66,825
17	Bear Ridge.....	New Plains	Philadelphia city..	Mumper and oth's.	4,689
18	Hon'y Brook 3,	New Pottsville...	H. Brook C. Co.....	H. B. C. Company..	196,952
19	Cambrian..	Ashland.	P. R. C. and I. Co.	Atkins & Co.	17,291
20	Plank Ridge...	Shenandoah city	P. R. C. and I. Co.	Lee & Grant.	133,103
21	Grant	Mahanoy city.....	Delano Land Co...	Dr. Yocum.....	2,513

ASHLAND DISTRICT—*Continued.*

No.	Names of collieries.	Location.	Land owners.	Names of operators.	Tons mined.
22	West Lehigh	Shenandoah	P, R. C. and I. Co.	White & Co.	5,351
23	Preston, No. 1,	Girardsville.	P. R. C. and I. Co.	Wm. Kendrick	13,171
24	Preston, No. 2,	Girardsville	P. R. C. and I. Co.	Wm. Kendrick	54,610
25	Boston Run	St. Nicholas	P. R. C. and I. Co.	Althouse & Bro	62,000
26	Bear Run	Gilberton	P. R. C. and I. Co.	Wiggan & Trebles	74,430
27	Furnace	Gilberton	J. Gilbert	Atkins & Bro.	26,777
28	Draper	Gilberton	J. Gilbert	Wm. Draper & Co.	125,544
29	Girard.	Girardsville	Philadelphia city.	Beatty & Garretson	39,791
30	Coal Ridge	Mt. Carmel	L. Val. R. R. Co.	Berton & Bro.	
31	Kohinoor	Shenandoah city	J. Gilbert	R. Heckscher & Co.	104,743
32	Tunnel Ridge.	Mahanoy city	P. R. C. and I. Co.	G. W. Cole	83,760
33	Elmwood	Mahanoy city	P. R. C. and I. Co.	Lee & Wren.	5,339
34	Gilbert	Gilberton	J. Gilbert	Gilberton C. Co	65,227
35	Ellen Gowan	Maple Dale	P. R. C. and I. Co.	J. C. Scott & Sons	76,409
36	Girardsville	Girardsville	Philadelphia city.	Agard & Moody	84,947
37	M'Michael.	Girardsville	Philadelphia city.	Agard & Moody	18,822
38	Preston, No. 3.	Girardsville	P. R. C. and I. Co.	Wm. Kendrick	2,055
39	Preston, No. 4.	Girardville	P. R. C. and I. Co.	Wm. Kendrick.	52,503
40	Keystone	Locust Dale	P. R. C. and I. Co.	Wm. Kendrick	24,845
41	Union	Centralia	Girard heirs.	Ryon & Anderson	47,394
42	Malvern	Mahanoy city	P. R. C. and I. Co.	A. Hunt.	19,248
43	Copley	Mahanoy city	L. Val. R. R. Co.	Lentz & Bowman	75,226
44	Glendon	Mahanoy city	L. Val. R. R. Co.	J. B. Boylan	25,244
45	Locust Run.	Ashland.	Locust Mt. C. I Co.	G. S. Ripplier	84,309
46	Lehigh, No. 3.	Shenandoah city	Girard heirs.	Philad'a C. Co.	53,250
47	Continental	Centralia	Philadelphia city.	R. Gorrell, Agt	93,139
48	Lilly	Ashland.	P. R. C. and I. Co.	Wm. Kendrick	44,917
49	Colorado	Colorado	P. R. C. and I. Co.	Philad'a C. Co.	127,089
50	Shenandoah C,	Shenandoah city	P. R. C. and I. Co.	J. O. Rhoades	74,061
51	Hazle Dale	Centralia	Locust Mt. C. I Co.	Robert Gorrell.	73,889
52	Beaver Run	Mahanoy city	Delano Land Co.	Peter Bowman	2,026
53	Excelsior	Ashland.	P. R. C. and I. Co.	J. R. Cleaver.	9,234
54	Thomas	Shenandoah city	Girard heirs.	Thomas Coal Co.	106,279
55	Hill Side	Mahanoy city	P. R. C. and I. Co.	G. Pomroy	8,349
56	Turkey Run.	Shenandoah city	Gilbert & Sheafer.	Breneizer & Co	77,469
57	Girard Mam'th	Raven Run	Girard heirs.	J. Donaldson	39,996
58	Lost Creek	Colorado	Philadelphia city.	Philad'a C. Co.	63,459
59	Tunnel	Ashland	P. R. C. and I. Co.	J. K. Seigfreid	1,475
60	Cuyler	Raven Run	Girard heirs.	Heaton & Bro	41,617
61	Hartford	Mahanoy city	Kear & Patterson.	H. Eshelman.	36,498
62	W. Shenand'h,	Shenandoah city	Gilbert & Sheafer.	Maize & Lewis	9,487
63	Eagle.	Centralia	Girard heirs	P. Brenzle	6,059
64	Centralia	Centralia	Locust Mt. C. I Co.	J. M. Freck	69
65	Big Mine Run.	Ashland	P. R. C. and I. Co.	Taylor & Lindsy	11,742
66	Pioneer Drift.	Ashland	P. R. C. and I. Co.		2,000
67	Burget	Ashland.	P. R. C. and I. Co.	J. D. Gilmore	331
68	J'nsW'd&Ol'er			J'nes W'd & Oliv'r	5,252
69	Silliman	Mahanoy city	P. and M. C. Co.	Rom'l, Hill&Harris	76,727
70	B. L. Eshelm'n		Kear & Patterson.	B. L. Eshelman	5,712

WILLIAM PENN SHAFT COLLIERY.

This colliery is situated west of Shenandoah city, upon the Girard estate; but latterly the estate of the Philadelphia and Reading coal and iron company. It has been 8 years in operation; consists of a shaft and drift openings; the drift workings are finished; the shaft is sunk on the E vein; 2,900 yards of gangways are open, embracing 5 different courses; 46 breasts are working on 3 different coal seams, the aggregate thickness of which are 45 feet. One safe out-let has been opened, and the colliery is in splendid condition. One hundred and sixty-four persons are employed inside, and 75 persons outside=239.

Ventilation is produced by a 20-horse steam fan. An air hole is also used to assist in ventilating the mine, producing 18,200 cubic feet per minute; the necessary supply would be 16,104 cubic feet per minute. This result is satisfactory for men, lights and animals. Six steam engines are used=275-horse power, and 8

good boilers, with all their equipments in good condition. Outside temperature 60°, and inside 65°. Barometer indicated 29¼ outside, and 29 7-10 inches inside. This result was satisfactory, showing very little presence of fire-damp. Sixty wagons and 10 mules are used; 289 hands are employed, and 4,400 yards of track in use. Eighty tenant houses, occupied by 100 families, are erected on the premises. Monthly shipments 10,000 tons. Value of improvements, estimated at $35,000. One death during the year.

INDIAN RIDGE COLLIERY.—*William Kendrick, Operator.*

This colliery is situated at Shenandoah. It has been 3½ years in operation. It consists of a double track shaft, sunk —— yards deep, on the E vein, and now owned by the Philadelphia and Reading coal and iron company. Three gangways of 600 yards in length are opened, working 16 breasts, schutes and headings. The coal seam is split; the coal is 45 feet in thickness, and considered to be among the best coal in market. The character of work done is considered safe. Sixty-four hands are employed in the mine, and 30 outside=94 hands.

Ventilation is produced by a 20-horse fan, which result is satisfactory, supplying 13,260 cubic feet of air. Outside temperature 60°, inside temperature 65°.—Barometer outside 29 3-10, and inside 29 5-10 inches. This result is favorable to the condition of the air, and the supply necessary for the force employed.

Five steam engines=300-horse, and 8 boilers, are in use, with all their appointments in excellent condition. Mine regulations are established for the safety of men. Two accidents, resulting in death, and one injury, occurred during the year. Thirty wagons and 6 mules are used in the mine; no indications of fire-damp is apparent; 880 yards of track is laid. Monthly shipments is 5,000 tons. Value of improvements estimated at $200,000. After a careful examination of the premises, I directed some improvements to be made in regard to ventilation.

LOCUST DALE COLLIERY.—*S. Harris, Agent.*

This colliery is situated west of Ashland, in Columbia county, on the estate of the Philadelphia and Reading coal and iron company. It has been 19 years in operation. It consists of a slope opening; the slope is a double track opening, sunk in two lifts 310 yards deep on the E vein. A pump slope is sunk east of the coal slope, which is used also for a traveling road; the E and D seams are worked; the coal is 40 feet thick. Three hundred yards of gangway are open, working 10 breasts. The character of work doing is safe.

Ventilation is produced by a 30-horse steam fan, which produced but nominal relief for a time until improved, which gave satisfactory results in supplying 18,475 cubic feet of air per minute. Outside temperature 56°, and inside 60°.

Five steam engines are in use equal to 475-horse, and 16 boilers with all their appointments are in good order. Two persons were killed; 2 persons died of their injuries and 10 persons were burned by explosions of gas. Sixty-two wagons, 8 mules and 1,900 yards of track is used. Eighty tenant houses occupied by 100 families. Monthly shipments 3,375 tons. Value of improvements $200,000.

EAST MAHANOY COLLIERY.—*Focht, Wittaker & Co., Operators.*

This colliery is situated east of Mahanoy city, upon the Delano tract. It consists of a shaft opening on the Buck Mountain vein in 2 lifts. Four principal gangways are open=957 yards in length, working 30 breasts, shutes and headings. Three veins are worked; aggregate thickness of coal 36 feet. Seventy-six hands are employed in the mine; the sort of work done is considered safe. Two persons were accidentally killed and one person injured during the year.

Ventilation is produced by a steam fan of 10-horse power; the air is not distributed quite satisfactory, but improvements are in progress, which will effect the desired result.

Three steam engines are in use=100-horse power, and 4 steam boilers. Fifty-three wagons, 9 mules and 1,800 yards of track is used. Two tenant houses with two families; monthly shipments is 2,000 tons; value of improvements $10,000; 6,000 cubic feet of air has been supplied per minute.

WEST LEHIGH, NO. 4.—*White & Packer, Operators.*

The colliery is situated north of Mahanoy City. It has been two years in operation, on the present estate of P. R. C. and I. company. It consists of a slope sunk on the E vein. The D and G veins are worked in conjunction with the slope workings. Six gangways are open, aggregate length 725 yards, working 30 breasts, schutes and headings. Seventy-four feet of coal is worked in this mine. Five different lifts are sunk in connection with the colliery, having two safe out-lets for men. One hundred and ten persons are employed inside and 40 persons outside. The character of work done I consider good.

Ventilation is produced by two 15 horse steam fans, 2 furnaces and 5 air-holes. The means supplied, if properly applied, would doubtless be sufficient to produce the necessary quantum of air. To remedy this deficiency, I have recommended such improvements as will shortly effect a proper result.

Seven steam engines are used=268 horse power, and 19 boilers, with their equipment, are found in good condition. Forty-four mine wagons and 14 mules are used. Two thousand five hundred yards of track is used. Fifty tenant houses, occupied by 40 families, are on the place. Monthly shipments, 3,000 tons. Value of improvements, $10,000. No fire-damp is generated in the mine. Outside temperature 45° and inside temperature 50°. I could not well ascertain the quantum of air supplied, but its condition was fair.

KNICKERBOCKER COLLIERY.—*W. P. Fowler, Operator.*

This colliery is situated at Yatesville, on the present estate of the P. R. C. and I company. It is 9 years in operation. It consists of a slope and 5 drift openings. The slope is a double track opening, sunk 163 yards deep on the south dip of the E vein, on an angle of 40°. The drift workings are nearly exhausted. Four hundred yards of gangways are open in the slope, and 32 breasts are working. Two veins are operated in the mine. Seventy-five hands are employed inside and 68 hands outside. The coal seams are together 28 feet thick.

Ventilation is produced by a 10-horse steam fan and an air-hole, yet the supply is not satisfactory. I have instructed the boss to remedy this defect.

Six steam engines are in use=190 horse power and nine steam boilers, which with all their equipments are in good condition. Seventy-seven mine wagons and 20 mules are used; 1,730 yards of track are used; 60 tenant houses, occupied by 80 families, are on the place; monthly shipments 6,000 tons; value of improvements is $50,000.

M'NEAL COLLIERY, NO. 1.—*White, Fowler & Co., Operators.*

This colliery is situated at Yeatsville, on the estate of the P. and R. R. R. Co. It has been nine years in operation, and consists of a slope sunk in two lifts on the Primrose vein. Eight hundred and sixty yards of gangway are open in the mine. Fifty yards of a tunnel open the E vein on the M'Neal level. Forty-three breasts are worked in the mine and six veins are producing coal, the aggregate thickness of which is 81 feet. The character of work done is safe. A furnace produces ventilation for this mine. Some fire-damp is generated in the mine.

M'Neal Colliery, No. 2.

This colliery is worked in connection with No. 1 upon the same coal seams. It consists of a double track slope opening on the Primrose vein. Both north and south dips are worked here, and the mine is ventilated by a fan All the work done is quite safe. Five hundred and seventy-five yards of gangway are opened, and mining operations are conducted similar to that in No. 1 mine.

M'Neal Colliery, No. 3, or Barry Slope.

William Kendrick, Esq., general agent of the Philadelphia and Reading Coal and Iron Company, operates all three collieries for that company, and the three collieries are so reported upon conjointly as their tonnage, steam power, force employed and value. No. 3 is a double track slope colliery, sunk on the Primrose vein. Ventilation is produced by a furnace. Two engines are in use, with seven boilers and equipments, all of which are in good order.

Thirteen gangways are open on the three collieries, amounting to 1,732 yards in length. Two safety outlets are used. No steam fans are used, but seven different air-holes are open for ventilating purposes. Three hundred persons are employed inside and 240 persons outside. — steam engines of — horse power are used, with 22 steam boilers, which with all their equipments are found in good order. One hundred and thirty tenant houses, occupied by 150 families; 83 mine wagons and 25 head of mules are used; 5,280 yards of track are used; monthly shipment 18,000 tons; value of improvements is estimated at $500,000.

Primrose Colliery.—*Charles B. Nevils & Brother, Operators.*

The colliery is situated at Mahanoy City, upon the estate of Caldwell and others, and has been nine years in operation. It consists of drift and slope opening on the G vein. The slope has been opened on the hill 73 yards above the drift level and sunk 51 yards under the drift level to the basin of that vein. The F, E, Seven Feet, D and B veins underlie this basin. Sixty yards of a tunnel running south opens the G and E veins, and another tunnel from the E vein opens the F vein. There are 4 gangways open of 3,720 yards in length; 34 breasts are worked, &c.; a 12-horse fan, a furnace and 5 air-holes ventilate the mine, which at present are not satisfactory. I have directed the necessary changes to be made which will remedy this evil. One hundred and four inside and 50 outside hands are employed; 3 engines of 165 horse power, with 6 boilers, are used; 12 mules and 44 wagons are used; monthly shipments 7,000 tons; value of improvements is $——: casualties during the year were one death and two injuries; 3,500 yards of track are in use in and about the colliery.

Mahanoy City Colliery.—*Messrs. Hill, Romell & Harris, Operators.*

The colliery is situated at Mahanoy city. It consists of a double track slope, sunk 166 yards deep on the south dip of the E vein, with four drifts open on other veins, and a tunnel opens the G vein. Six gangways, whose aggregate length is 627 yards, are open, working 30 breasts of coal. There are 5 veins on the tract. The thickness of coal in these seams amounts to 33 feet. The character of work done is satisfactory.

Ventilation is produced by a 15-horse steam fan, a furnace and 3 air holes, all of which are practically applied and produce satisfactory results. There are 72 persons employed inside and 30 outside. Four steam engines are in use = 165-horse power, and 6 good steam boilers, with all the machinery and tackle, is in good condition.

SAINT NICHOLAS COLLIERY.—*Dennison and others, Operators.*

The colliery is situated at St. Nicholas and is 10 years in active operation. The estate is included in the purchase of the P. and R. C. and I. Co. It consists of a double track slope, 122 yards deep on the E vein. There are 4 coal seams worked in connection with the E seam, *i. e.*, the 7 and 4 feet, the F and D seams. 7 different gangways are open, whose aggregate length is 1,655 yards; 104 breasts with schutes and heading, are worked, all of which are practically managed. The coal in these will exceed 82 feet in thickness. Four safety outlets are open for egress and ingress.

Ventilation is produced by a 16-horse steam fan and 8 different outlets, the condition of which is satisfactory. Seventy-three inside and 84 outside hands are employed.

Five steam engines are in use = 275-horse power, and 14 good steam boilers. A speaking tube is used in the slope which serves an excellent purpose; 60 mine wagons and 20 mules are used; 2,880 yards of track is used; 40 tenant houses, occupied by 60 families, are on the premises. Monthly shipments are 12,000 tons. Value of improvements is $———. 6 persons received injuries during the year.

DELANO COLLIERY.—*Gorman and Wintersttne, Operators.*

The colliery is situated east of Mahanoy City, on the estate of the Lehigh Valley R. R. Co. It has been 10 years in operation. It consists of a double track slope, sunk 170 yards deep on the E vein, on a dip 46° north. The slope is only 2 years in operation. The Buck mountain vein is worked in connection with this slope by a drift 700 yards in length; 3 gangways are open = 555 yards. 15 breasts are worked, together with schutes and headings, etc. The 7-feet vein is also open. The three seams will average 25 feet in thickness. The character of work done is safe.

Ventilation is produced by a 15-horse steam fan, a furnace and 2 air holes. The system of controlling the air required a different plan, which I recommended to be adopted, in order to improve its condition and increase the supply. 93 hands inside and 41 outside are employed.

Three steam engines of 92-horse power are used, and 9 steam boilers, with all their appointments, are in good condition; 30 wagons and 8 mules are used; 1,786 yards of track is used. Monthly shipments are 5,000 tons. Value of improvements, $50,000. No calamity occurred during the year.

SUFFOLK COLLIERY.—*John Phillips & Co., Operators.*

The colliery is situated east of St. Nicholas, on the estate of the Philadelphia and Reading coal and iron company, and has been 10 years in operation. It consists of 3 drift openings, with 7 gangways=7,998 yards in length. Thirty breasts are worked. Aggregate thickness of coal, 32 feet. Two slope lifts are sunk 110 yards deep on the south dip of the Primrose or G vein. Two safety roads are open for miners. The character of work done is considered a safe operation.

Ventilation is produced by a 10-horse fan and 3 air outlets. I found it necessary to direct a different system for ventilating the mine to that which was adopted, in order to increase the supply and better its condition. Fifty-eight persons are employed inside, and 75 persons outside.

Two steam engines, of 40-horse power, and 4 boilers are used. Fifty-six mine wagons and 20 mules are used. One thousand yards of track are used. Seventy-five tenant houses, with 75 families, are on the premises. Monthly shipments, 8,000 tons. Value of improvements, $180,000. No casualties during the year.

STANTON COLLIERY.—*Miller and Mays, Operators.*

The colliery is situated near the foot of the Frackville planes, upon the estate of John Gilbert and others. It has been one year in operation. It consists of a double track slope, sunk on the south dip of the E vein. The location is particularly favorable for a colliery of its kind. Two main gangways are open, only 150 yards in length, working 4 breasts, schutes, headings and gangway extensions, which, of its kind, is a safe operation.

Ventilation in April was produced by a steam jet, but a 30-horse fan is used.

Thirty-eight outside and 48 inside hands are employed. Two steam engines of 130-horse power, with 6 steam boilers, are used. All their appointments and fixings are in good condition. Twenty-one wagons and 6 mules are used. Eight hundred and ten yards of track are in use. Monthly shipments, 2,800 tons. Value of improvements, $———. No accident occurred during the year. Drainage and ventilation are satisfactory.

LAWRENCE COLLIERY.—*Jacob Lawrence and others, Operators.*

The colliery is situated at the Frackville planes, on the estate of John Gilbert and others. It is four years in operation and consists of a double track slope sunk 100 yards deep on the north dip of the E vein. The angle of dip is 55°. The coal is found to be 40 feet thick. Two gangways are open = 1,400 yards; 64 breasts, schutes, headings and extensions are carried on, all of which work is a safe operation. A safety road for miners is open.

Ventilation is produced by a 20-horse fan. This improvement has been added this season, and connected with this is an air-outlet. The drums are secured by good breaks; 48 inside and 40 outside hands are employed; 4 steam engines of 170-horse power, with 9 good boilers are in use; all their appointments are in good condition; 35 wagons and 12 mules are used; 2,000 yards of track is used; 4 tenant houses with 4 families are on the premises; monthly shipments are 8,000 tons. Some small quantity of fire-damp is generated at present, but not in any sufficient amount to excite alarm. This matter receives especial attention.

BEAR RIDGE COLLIERY.—*A. L. Mumper and others, Operators.*

This colliery is situated near the foot of Frackville planes, upon the estate granted by Mr. Girard to the city of Philadelphia, and has been in operation nine years. It consists of a double track slope sunk in two lifts 240 yards deep on the south dip of the E vein. A pumping slope is also open for drainage. A tunnel opens the D—— vein. Two gangways are open = 300 yards, working 14 breasts. The E vein is exhausted on the present lift. The coal is 30 feet thick. The character of the work done is safe.

Ventilation is produced by a 20-horse fan, and in conjunction with it an air outlet is open; 18 inside and 6 outside hands are employed; 5 steam engines = 400 horse power, with 20 steam boilers; 40 wagons and 10 mules are used; 840 yards of track is used; 53 tenant houses with 55 families are on the premises.

HONEY BROOK COLLIERY, NOS. 1, 2, 3 AND 4 SLOPES.—*Honey Brook Coal Company, Operators.*

These collieries are situated at New Pottsville, "near Audenreid," in the extreme eastern limits of Schuylkill county, upon the estate of the said operators. They are some ten years in operation. Three of the slopes are sunk on the Wharton and E seams, in Schuylkill county, and the fourth slope lies in Carbon county. The excavations extend into each county from each slope. The E vein is 30 feet in thickness. The slopes are sunk in unequal depths, so as to supply lifts The work is well managed for safety and ventilation.

CAMBRIAN COLLIERY.—*John Lewis & Co., Operators.*

The colliery is situated west of Ashland, on the estate of the P. R. C. and I. company; is three years in operation. It consists of a double track slope, sunk 123 yards deep in a new lift. The aggregate depth of the slope is 162 yards on the E vein. Three gangways are open=650 yards in length. Four breasts are working, with schutes, headings, &c. The coal is 25 feet thick, and the character of work done is considered safe.

Ventilation is produced by a 20 horse steam fan.

PLANK RIDGE COLLIERY.—*Lee, Grant & Co., Operators.*

This colliery is situated on the eastern suburbs of Shenandoah city, upon the estate of the P. R. C. and I. company. It has been 12 years in active operation. It consists of a shaft sunk 100 yards deep on the E vein; the 7 foot vein is also worked by this shaft; 4 gangways are open=2,400 yards in length; 40 breasts are worked; there are 3 lifts worked in the mine; the coal is 40 feet thick; 5 different safety roads are used as egress and ingress traveling roads. Mining has been conducted upon a large scale in this colliery since its commencement, all of which appears to be safe and well managed.

Ventilation is produced by natural means and a furnace, which under the present management does considerable execution. Very little gas of any sort is met with. Powder smoke is the only troublesome matter to be met with. Two hundred persons are employed inside, and 110 persons outside. Six steam engines of 320-horse power, and 12 boilers, are in use. All machinery and appointments are in good condition.

One hundred and ten mine wagons and 27 mules are used; 10,350 yard of track is laid; 17 tenant houses, with 17 families, are upon the premises. Monthly shipments is —— tons. Value of improvements is $——. The temperature outside was 59°, and inside 60°. Barometer outside 29 3-10, and inside 29 1-10 inches; 13 persons received injuries during the year, none of which were killed or died of injuries.

Remarks.—A new slope lift has been commenced, to be excavated 150 feet under the present lift; the vein is nearly flat; the breasts are open as chambers, and the wagons are hauled into each. A conversation can be held by the miners with the miners of the Shenandoah city colliery.

GRANT COLLIERY.—*Dr. Yocum & Co., Operators.*

This colliery is situated north of Mahanoy tunnel, on the Delano land company's tract. It has been in operation 9 years. It consists of two drifts open on the Buck mountain and Skidmore veins; the coal is 18 feet thick; 24 breasts, schutes, headings and gangway extensions are working. Three veins are upon the tract, and the character of work done is safe. Fifty-six hands are employed inside, and 35 hands outside; 2 steam engines and 4 good steam boilers are used; 24 wagons and 8 mules are in the mine; 2,000 yards of 25 lb. railroad iron is used. Monthly shipments is 1,000 tons. Value of improvements is $50,000.

Ventilation is produced by a furnace and air holes, and the supply is not quite adequate. The absence of gases relieves the miners from some responsibility and restraint in their avocations, that would not be the case had gases been present.

WEST LEHIGH COLLIERY.—*White & Co., Operators.*

This colliery is situated west of Shenandoah city, upon the estate of the P. R. C. and Iron Company. It is three years in operation. It consists of a drift and slope opening on the E vein. The D vein is also worked in connection with the slope; 5 different gangways are open = 700 yards in length; 25 breasts are worked with schutes, &c.; 4 seams are in the tract; the thickness of workable coal is 50 feet; 3 lifts are sunk; 2 good out-lets for travel are open.

Ventilation is produced by two furnaces and three air outlets. The supply is not sufficient to remove the powder smoke, which is unhealthy for respiration. The workingmen complain of this troublesome agent. I have recommended a change in the present plan which will remedy this evil. Seventy-eight inside and 38 outside hands are employed at the colliery; 5 steam engines=175-horse; 9 steam boilers are in use, with all their machinery and equipments are in good order; 45 wagons and 15 mules are used; 1,000 yards of track is laid; 30 houses with 30 families are on the premises; monthly shipments are 5,000 tons. Value of improvements $50,000.

PRESTON COLLIERY, NOS. 1 and 2.—*William Kendrick, General Agent—Philadelphia and Reading Coal and Iron Co., Operators.*

These two collieries are situated at Girardsville, upon the operators' estate, are 11 years in active operation. No. 1 consists of a drift open on the Red Ash seam, T and a drift open on the D seam. All the coal mined is prepared in the same breaker of No. 2 colliery.

Ventilation is produced by a 10-horse fan, which suppies moderate ventilation. The character of work done is considered safe. The engines, gangways, &c., connected with this mine will be accredited to colliery No. 2.

PRESTON (No. 2) COLLIERY.

The report of this colliery is connected with that of No. 1, as twin collieries. There are 14 separate gangways open, which will exceed 5,280 yards in length; 15 breasts are working with schutes, headings and extensions; the coal of the three veins is 52 feet thick; 2 slope lifts and 4 water levels are operated; 5 safety roads are available for travel.

Ventilation is produced by three steam fans, which appears to be adequate in furnishing a sufficient supply of air. One hundred and thirty-five inside and 80 outside hands are employed; 7 steam engines of 290-horse power, and 16 boilers, are in use, with all machinery, tackle and appointments in good condition; 80 mine wagons and 30 mules are used; 7,040 yards of track is laid; 52 houses and 52 families are upon the place. Monthly shipments is 10,000 tons, and value of improvements is $150,000. No accident of any serious nature occurred during the year. The prospects of the colliery are favorable, and further improvements under the new company are progressing favorably. One death and 2 injuries during the year.

BOSTON RUN COLLIERY.—*Althouse & Brother.*

This colliery is situated east of Frackville planes, on the estate of the Philadelphia and Reading coal and iron company. It has been 12 years in operation, and consists of a double track slope sunk on the north dip of the E vein. The 7 feet, the 10 feet and Buck Mountain veins, are worked by a tunnel. Four gangways are open 1,800 yards in length; aggregate thickness of coal is 45 feet; the slope is sunk one lift only, and the character of the work done is good and safe.

Ventilation is produced by a 20-horse fan and two air out-lets. The plan adopted results satisfactory at present; 57 inside and 60 outside hands are employed; 5 steam engines=160-horse, and 10 good steam boilers, with all their appointments, are in good order. Fifty-five wagons and 8 mules are used; 2,000 yards of track is laid; 50 houses and 50 families are on the premises. Monthly shipments 1,000 tons, and value of improvements $150,000. One death and 3 injured during the year.

BEAR RUN COLLIERY.—*Wiggan & Treibles, Operators.*

This colliery is situated at St. Nicholas, upon the estate of the Philadelphia and Reading coal and iron company. It has been 13 years in operation. It consists of a double track slope, sunk 200 yards deep on the E vein. The Seven-Feet and D veins are worked in connection with this slope. Four gangways, making 2,000 yards in length, are open, working 17 breasts, schutes and headings, all of which work is considered a safe operation. There are six workable coal seams on the track; aggregate thickness, 67 feet. The slope is sunk 2 lifts. There are 2 safety roads open. Eighty-one inside and 60 outside hands are employed at the colliery.

Ventilation is produced by a 10-horse fan and 3 air outlets. The air is well managed and renders satisfaction. A new outlet is in progress of opening.

Six steam engines, of 395-horse power, and 14 good boilers, are used, with all their appointments, and are in good order. Fifty-two wagons and 14 mules are used. Three thousand yards of track are laid. Sixty houses, with 60 families, are upon the premises. Monthly shipments, ——— tons. Value of improvements, $———. No indications of fire-damp appear. One person was killed and one person injured during the year.

FURNACE COLLIERY.—*Atkins & Bro., Operators.*

The colliery is situated at Gilberton, upon the estate of John Gilbert and others. It has been 3½ years in operation. It consists of 2 drifts open on the E and D veins. Two gangways are open, 2,225 yards in length, working 3 breasts. The coal is 26 feet thick on the E vein, and 6 feet thick on the D vein. All the work done is considered safe. The mine is properly conducted.

Ventilation is produced by a furnace and 4 air outlets, which result satisfactorily. These seams are nearly flat workings. The breasts are used for a track road for haulage. Thirty-five inside and 30 outside hands are employed. One steam engine, of 25-horse power, with 2 boilers, 30 wagons and 11 mules are used in the mine. Four thousand yards of track are laid. Twenty-two tenant houses, with 24 families, are on the premises. Monthly shipments, 3,400 tons. Value of improvements, $32,000.

DRAPER COLLIERY.—*Draper & Co., Operators.*

The colliery is situated east of the Frackville planes, upon the estate of John Gilbert and others. It has been 9 years in operation. It consists of a slope sunk on the north dip of the E vein. One thousand six hundred yards of gangways are open, working 13 breasts, schutes and headings. The character of work done is considered a safe operation. The seam is 25 feet, and of an excellent quality. Slope No. 2 is sunk 136 yards deep upon the same vein, the coal of which is prepared in the new breaker. The old breaker is abandoned, and this new double breaker has the capacity of preparing all the coal that can be mined in the colliery.

Ventilation is produced by a 20-horse steam fan. The system adopted for ventilation is not quite satisfactory. Instructions have been given to remedy the error, which warrant a sufficient supply of air, by substituting a fan for each slope. One hundred and forty inside and 80 outside hands are employed.

Six steam engines of 395 horse power and 16 good boilers are in use, with all their appointments in good order; 50 wagons and 13 mules are used; 2,240 yards of track are laid; 62 houses, occupied by 70 families, are on the premises; monthly shipments 10,000 tons; value of improvements is $———.

GIRARD COLLIERY.—*Beatty & Garrettson, Operators.*

The colliery is situated east of Girardsville, on the Philadelphia city tract. It has been ten years in operation. It consists of a shaft 58 yards deep on the E vein to the water level. A slope is sunk 41 feet deep on the D seam. There are

4 gangways open; their aggregate length is 1,600 yards. There were 3 breasts working at the time. The coal is 33 feet thick. One good safety road is open for the safety of workingmen. Two 20-horse steam fans are used for ventilating the mine and two air outlets. All the work done is safe and satisfactory.

Ventilation is tolerable fair, but a change is recommended for improving it, which improvement will shortly be effected. One hundred and sixty inside and 70 outside hands are employed; 5 engines=230 horse power, with 14 good boilers, are used; 10 mules and 75 wagons are used; 2,236 yards of track are laid; 16 houses, occupied by 16 families, are on the premises; monthly shipments 6,000 tons; value of improvements is $100,000; outside temperature, 44°; inside temperature, 52°; barometer outside 29 and inside 29 3-10 inches.

COAL RIDGE COLLIERY (NORTHUMBERLAND COUNTY.)—*Berton, Brother & Co., Operators.*

The colliery is situated east of Mount Carmel, in Columbia county, on the estate of the Lehigh Valley railroad. It has been in operation some 16 years. It consists of a double track slope, sunk 200 yards deep on the south dip of the E vein. The angle of dip is 40°. Two gangways of 3,080 feet are open, with 18 breasts working, with gangway extensions, schutes and headings. The coal seam is 30 feet thick. Two safe travelling roads are available.

Ventilation is produced by natural means. Three air-holes are open to the surface. The plan of ventilation adopted was not adequate to supply the wants of the colliery, and hence the cause of complaint. I directed the necessary improvement to be commenced at once, which when completed will remedy this evil. 186 inside and 120 outside hands are employed; 6 steam engines of 555 horse power, with 12 boilers, are used, with all their appointments in good condition; 19 mules and 33 wagons are used; 34 houses, with 34 families, are on the premises; monthly shipments is 6,000 tons; value of the improvements, $100,000; outside temperature, 64°, inside, 68°; barometer outside 29 and inside 29 inches. This indication is favorable to the good condition of the colliery, being free from fire-damp.

KOH-I-NOOR SHAFT COLLIERY.

The colliery is situated west of Shenandoah City, on the estate of Gilbert & Sheafer. It consists of a double cage shaft, sunk 140 yards deep on the E seam to the basin. The Ten Feet vein is open in the shaft. The colliery has been four years in operation. Both these seams are worked by the shaft. This shaft is constructed upon the most approved modern English plan, and fully merits all the economical improvements claimed for it. These seams are nearly flat. The wagon tracks are laid into the chambers. The system of mining is but a few degrees removed from the English or Belgian system. Five steam engines of 211-horse power, with 8 steam boilers, are used. All their machinery and appointments are kept in excellent condition.

Ventilation is produced by a 20-horse steam fan. The plan adopted by the managers to ventilate the mine meets my approbation.

INDIAN RIDGE COLLIERY.—*William Kendrick, Esq., Operator.*

The colliery is situated at Shenandoah City, upon the estate of the P. and R. C. and I. Co. It has been in operation one year, and consists of a double track shaft, sunk — feet deep on the —— dip of the E vein. Four gangways are open= 550 yards, with 30 breasts, schutes, headings and extensions. The seam is 40 feet thick. A safety road is in course of completion. All the work done is considered a safe operation, and is managed in a practical manner.

Ventilation is produced by a 20-horse steam fan, which is put into practical operation, rendering the most satisfactory results. One hundred and ten inside and 70 outside hands are employed; 7 steam engines=210 horse power, and 14 boilers are used; 36 wagons and 11 mules are used; 1,550 yards of track.

TUNNEL RIDGE COLLIERY.—*George W. Cole, Operator.*

The colliery is situated at Mahanoy City, upon the estate of the P. and R. coal and iron company. It has been in operation some 8 years. It consists of a double track slope, sunk 160 yards deep on the north dip of the D vein. A drift has been opened on the E and 7 feet veins, which veins have been nearly exhausted of coal. Four gangways = 1,966 yards in length, are opened, working 121 breasts, schutes and headings. There are three safety roads open for the egress of workmen.

Ventilation is produced by a 20-horse fan, 3 air outlets and a steam jet, which produces a moderate supply of air. I directed the necessary changes to be made which will remedy this complaint.

Seven steam engines = 314-horse power and 12 good boilers are used, with all their machinery in good condition. Fifty-two inside and 120 outside hands are employed. No accidents occurred during the year. Twenty-two mules and 40 wagons are used; 4,130 yards of track is used; 46 tenant houses, with 46 families, are on the premises. Monthly shipments exceed 9,000 tons. Value of improvements, $———. Temperature outside was 64° and inside 69°. Barometer outside was 28 and inside 28½ inches. Fire-damp is not generated to any extent.

ELMWOOD COLLIERY.—*Lee and Wren, Operators.*

This colliery is situated in Mahanoy City, upon the estate of the P. and R. coal and iron company, and has been 1 year in operation. It consists of a double track slope, sunk 140 yards deep on the south dip of the G vein. Four veins can be opened into by a tunnel from the present level; 2 gangways are open some 350 yards. The character of work done is considered safe. Twenty-three inside and 20 outside hands are employed. Four steam engines are used = 150-horse, and 6 boilers, with all their equipments, are in good condition.

Ventilation is produced by a steam jet, which is not adequate to ventilate an extension of the excavations. One death and one injury occurred during the year. Seven mules and 16 wagons are used. Monthly shipments are ——— tons. Value of improvements is $75,000.

GILBERT COLLIERY.—*Gilbert Coal Company, Operators.*

The colliery is situated in Gilberton, on the operators' estate. It has been 14 years in active operation. It consists of two slopes. The new slope is 210 yards deep; the old slope is 100 yards deep and is used solely for drainage; 2 90-horse engines are used for this purpose. Two gangways are in use = 1,100 yards in length, working 53 breasts, schutes and headings. Only 1 vein is open though there are 6 veins available on the tract. This seam is 25 feet thick. Two lifts have been sunk on the E vein, and 5 safety roads are available for traveling. Seventy-eight inside and 50 outside hands are employed. Five steam engines of 450-horse power are used, and 14 boilers, with all their equipments, are in good condition. Ventilation is produced by a 12-horse steam fan. The supply and condition of ventilation is satisfactory.

The operators are now sinking the slope another lift, and at present are opening gangways in it, also breasts and headings. An air hole is open to communicate with the old level for the purpose of ventilating the new workings. A tunnel is also driven to the G vein. When these improvements are completed, this colliery will be among the first in the region. Twenty mules and 60 wagons are used; 3,520 yards of track are in use; 80 families are on the premises. Monthly shipments 10,000 tons, and value of improvements $300,000. Slight quantities of fire-damp are generated, but at present threatens no serious alarm. Temperature outside 63°, and inside 66°. Barometer indications outside was 28, and inside 28½ inches. Result satisfactory.

ELLEN GOWEN COLLIERY.—*I. C. Scott & Sons, Operators.*

This colliery is situated in Maple Dale, on the estate of the Philadelphia and Reading coal and iron company, and has been 10 years in operation. It consists of 5 drift openings on as many veins of coal; a shaft is in course of sinking with two 30-horse engines. There are at present 8 gangways open=3,560 yards in length; 33 breasts are worked with schutes, headings, etc.; the coal in these seams will make 69 feet in thickness; 4 safety roads are available for traveling.

Ventilation is produced by 2 furnaces and 3 air holes, which requires considerable trouble to give it free circulation through this extensive mine; all the coal mined is extracted above water level, and fire-damp is not of any consequence while this is the case; 133 inside, and 100 outside hands are employed.

Three engines of 100-horse power and 12 boilers are used, with all their equipments in good order and well conditioned; 90 tenant houses occupied by 100 families are on the premises. Monthly shipments is 8,000 tons, and value of improvements is $120,000. Temperature outside was 64°, inside 66°. Barometer indicated 28 outside, and 28 1-10 inside; result satisfactory; causalties during the year: 1 death and 2 injuries.

GIRARDVILLE COLLIERY.—*Messrs. Agard & Moody, Operators.*

This colliery is situated east of Girardville, on the Philadelphia city tract, and has been 10 years in active operation. It consists of several drift openings and upon different lifts above water line. The E and D seams are worked here, and are 58 feet in thickness. Five gangways are open, making 5,175 yards; 45 breasts are worked with schutes and headings; there are 4 safety roads available for traveling in and out.

Ventilation is produced by natural draft, and is in most cases good; no gases of any consequence is met with; 207 inside, 175 outside hands are employed; 45 mules, 110 wagons and 6,500 yards of track is used; 102 houses with 120 families are on the premises; monthly shipments are 1,200 tons, and value of improvements $200,000; no casualties during the year.

M'MICHAEL COLLIERY.—*Messrs. Agard & Moody, Operators.*

This colliery is situated east of Girardsville, in close proximity to the Girardsville colliery, and has been in operation four years. It consists of four drift openings on the D seam in four successive lifts, all above water line. The coal is 18 feet in thickness. There are three safety roads available for miners to travel in. 1,600 yards of gangways are open, working 15 breasts, schutes, &c. The character of work done is considered a safe operation.

Ventilation is produced by natural means and is found to work tolerably well. With a slight improvement a 10-horse steam fan would greatly improve ventilation. Three steam engines of 70-horse power and four boilers are used; 55 inside and 83 outside hands are employed; 5 mules and 26 wagons are used; 2,500 yards of track is used; monthly shipments are 7,500 tons. Value of improvements is $100,000. Casualties occurred during the year, resulted in one death.

A new slope is sunk 38 yards deep on the south dip of the D vein. At present its further progress has been discontinued. A necessity to increase the supply of coal by this improvement does not at present exist. The present drift openings can furnish any required supply.

PRESTON, NO. 3.—*Wm. Kendrick, Operator.*

The colliery is situated in Girardsville, on the south of the town. It has been ten years in operation. It consists of a slope and drift opening. The slope is sunk two lifts of 150 yards in depth on the north dip of the E vein. The estate is own-

ed by the P. R. C. and I. Co. The vein is 22 feet thick; 1,700 yards of a gangway is open; 3 breasts are worked. The character of work done is considered safe; 37 inside and 8 outside hands are employed; 2 engines of 80-horse power are used at present at the colliery; 3 boilers with all their appointments are in good order; 6 mules and 40 wagons are used; 26 houses with 26 families are upon the place. The monthly shipments are 2,000 tons. The value of the improvements now in progress will amount to $200,000.

The P. R. coal and iron company are improving the colliery on a large scale with a liberal expenditure, creating it a centre for a large business in its line.

PRESTON, NO. 4.—*William Kendrick, Operator.*

This colliery is situated at and west of Girardsville. upon the estate of the P. R. C. and I. Co. It has been nine years in operation. It consists of a tunnel 337 yards long on the E vein; two gangways are open = 3,410 yards in length. The character of work doing is robbing pillars and extracting loose coal. The seam is 25 feet thick and is finely formed. One steam engine is used = 50-horse, and four boilers with all their appointments are in good order; 17 mules and 60 wagons are used; 26 houses and 26 families are on the premises; 4,000 yards of tracks are used; 17 inside and 20 outside hands are employed = 37 hands. Monthly shipments 2,000 tons. Value of improvements is $100,000.

KEYSTONE COLLIERY.—*Wm. Kendrick, Operator.*

This colliery is situated west of Ashland, upon the estate of the Philadelphia and Reading coal and iron company. It has been 12 years in operation, and consists of two slopes and a drift opening; one a double track coal slope. The single track slope is used for drainage, men and material used in the mine; both slopes are sunk on the E vein 150 yards deep; 2 gangways are open 650 yards, working 13 breasts, schutes and headings; the coal seam is 20 feet thick. The works are managed in a practical manner, and considered safe. Two safety roads are available for miners use.

Ventilation is produced by a 40-horse fan, and the result is satisfactory. One hundred and one inside and 75 outside hands are employed; 9 steam engines of 407-horse power, and 23 steam boilers, are in use, with all their appointments in good condition; 18 mules and 40 wagons, with 2,690 yards of track is used; 48 houses, with 48 families, are on the premises. Monthly shipments 5,000 tons, and value of improvements $150,000. No casualties during the year, yet fire-damp is largely produced in this mine.

UNION COLLIERY, (COLUMBIA COUNTY.)—*Hon. J. Ryon & Anderson.*

This colliery is situated north of Ashland, near the Schuylkill county line, on the Girard estate. It has been 8 years in operation, and consists of a drift open on the E seam; the D vein is opened by a tunnel, and the coal in these seams is 30 feet thick. Three gangways are open 4,410 yards in length, working 10 breasts, schutes, headings, etc. The character of which work is considered safe.

Ventilation is produced by natural means, three air holes and a furnace; under this system the ventilation is tolerably fair. The works being all above water line, very little gas has been met with, owing to the large deposit of coal lying above water level; it will require several years labor to exhaust these drifts.

Three steam engines=66-horse, and 4 steam boilers, with all their appointments, are in good order; 71 inside and 45 outside hands are employed; 16 mules and 53 wagons are used. A 20-horse power locomotive is used for hauling to and from the mine.

MALVERN COLLIERY.—*Alfred Hunt & Co., Operators.*

This colliery is situated north of Mahanoy city, upon the estate of the Lehigh Valley railroad company, and has been 8 years in operation. It consists of a tunnel opening three veins; 8 gangways are open in the mine, constituting 3,880 yards in length; 5 seams are open, working 12 breasts, schutes, headings, etc., and the top rock is somewhat dangerous,

Ventilation is produced by a furnace and air holes opened out to the surface. The works are all above water line, and so far very little gas is met with; the coal in these seams will give 46 feet in thickness; 45 inside and 45 outside hands are employed; the character of work done is considered safe.

Two engines of 40-horse power and 3 steam boilers, with all their fixtures, are in good condition; 17 mules and 60 wagons, together with 4,180 yards of track, are in use; 15 houses and 13 families are upon the premises. Monthly shipments 6,000 tons; value of improvements, etc., ——. Temperature outside 80°, inside 70°. Barometer indicated outside 28, and inside 28¼ inches. No casualties during the year.

COPLEY COLLIERY.—*Lentz & Bowman, Operators.*

This colliery is situated north of Mahonoy City, upon the estate of the Lehigh Valley railroad company, and has been 9 years in operation. It consists of drift openings on the B and 7-feet coal seams, all above water line. Four principal gangways are open, making some 630 yards in length, working 20 breasts, schutes, heading and extensions. The coal in the seams is 40 feet thick. The character and condition of the work is safe.

Ventilation is produced by a furnace and air-holes open to the surface, producing satisfactory results.

One hundred and eight inside and 60 outside hands are employed. Four casualties occurred during the year, resulting in 1 person being killed, 2 persons dying of injuries, and 1 injured. The inquests in these cases rendered verdicts of accidents.

Two steam engines, of 60-horse power, and 6 good boilers, with all machinery and fixings, are used and in good order. Twenty-two mules and 60 wagons are used. Two thousand seven hundred yards of track are used. Eleven houses, occupied by 11 families, are upon the premises. Monthly shipments, 9,000 tons. Value of improvements estimated at $70,000.

GLENDON COLLIERY.—*J. B. Boylan, Operator.*

The colliery is situated north of Mahonoy City, upon the estate of the Lehigh Valley railroad company, and has been 9 years in operation. It consists of a double track slope, sunk on the Seven-Feet vein 160 yards deep, with 2 gangways open. The D vein is opened by a tunnel. Twenty breasts are worked, together with other improvements. Sixty-six inside and 43 outside hands are employed. The character of work done is considered safe, and the mines are properly managed.

Ventilation is produced by a 20-horse fan and 3 air-holes, under which system the results are satisfactory. Three engines, of 75-horse power, and 9 boilers are used, with all their appointments, and are in good condition. Eight mules and 30 wagons are used. One thousand three hundred yards of track are used. Eight houses are upon the premises. Monthly shipments, 3,200 tons. Value of improvements estimated at $50,000. Outside temperature was 75° and inside 60°. Barometrical indications outside were 28¼ and inside 28¼ inches, indicating the condition of ventilation to be satisfactory. No casualties during the year.

LOCUST RUN COLLIERY.—*George S. Repplier, Operator.*

The colliery is situated north of Ashland, upon the estate of Locust Mountain coal and iron company, and has been 16 years in operation. It consists of a double track slope, sunk 285 yards deep on the south dip of the E seam in three lifts. Two gangways are open. The seam is 40 feet thick. These gangways are open 900 yards west and 350 yards east=1,250 yards, working 7 breasts, schutes, headings, &c. The character of work done is considered safe. A good safety road is available for men to pass in. Fire-damp is generated in the mine to a considerable extent.

Ventilation is produced by a 20-horse steam fan and an air out-let, the operation of which gives satisfactory results. Great vigilance and industry is required on the part of the officers to keep the mine clear of fire-damp and protect the men. Eighty-five inside and 115 outside hands are employed; 8 steam engines of 525 horse power and 22 boilers are used; 15 mules and 40 wagons, with 1,500 yards of track, are used; monthly shipments, 9,000 tons; value of the improvements estimated at $150,000. The casualties that occurred during the year were two persons killed, two died of injuries and ten were injured, all from effects of explosions of fire-damp.

LEHIGH, NO. 3.—*Philadelphia Coal Company, Operators.*

The colliery is situated west of Shenandoah, upon the estate of Mr. Girard. It has been in operation 6 years, It consists of 2 drifts and a double track sunk 110 yards deep on the south dip of the E vein. The seam is 45 feet thick. Two gangways are open of 800 yards in length, working 22 breasts, schutes, headings, &c. The character of which work is considered a safe operation. The system adopted is upon a practical plan.

Ventilation is produced by a steam fan, the operation of which is adequate to supply the mine with a full quantity. As no fire-damp exists no danger is apprehended. Four steam engines and eight boilers are in use, which with all their appointments and machinery are in good order. Sixty inside and 34 outside hands are employed; 8 mules and 22 wagons are in use; 1,780 yards of track is used; 12 houses and 12 families are on the premises. Monthly shipments ——— tons. Value of improvements is ———. Casualties during the year, three deaths and five injuries.

CONTINENTAL COLLIERY, (COLUMBIA COUNTY.)—*Robert Gorrel, Agent.*

The colliery is situated east of Centralia, on the Philadelphia city tract, and has been nine years in operation. It consists of a double track slope sunk 175 yards deep on the south dip of the E vein, the coal of which is 25 feet thick. Two gangways are working; 8 breasts, schutes, headings, &c., are working, the character of which is a safe operation; 2 safety travelling roads are available; 1,374 yards of gangway are open.

Ventilation is produced by a 20-horse fan, the operation of which supplies sufficient quantum of air. Seventy-seven inside and 52 outside hands are employed, and in addition 50 boys = 179 hands. Six steam engines of 290-horse power, with 13 boilers are used; 14 mules and 38 wagons, 1,974 yards of track are used. Casualties—one person had a leg broken. Monthly shipments, 9,000 tons. Value of improvements $200,000.

UNION COLLIERY, (SCHUYLKILL COUNTY,)—*Emanuel Bast, Operator.*

This colliery is situated east of Ashland, on the estate of the Philadelphia and Reading coal and iron company. It has been 12 years in operation, and consists of a double track slope, sunk 274 yards deep, on the south dip of the E vein, with 4 drifts above water level, all of which openings are supplying coal; all

these gangways will aggregate 2,600 yards in length; 74 breasts are working with extensions, schutes and headings. Three seams are open, the coal of which is 25 feet thick. All the work done is conducted upon a safe practical plan, although a large quantum of fire-damp is produced.

Ventilation is good, a 40-horse steam fan is used for this purpose, and is found adequate. Seventy-eight inside and 75 outside hands are employed; 7 steam engines of 880-horse power are used, and 16 boilers with all their appointments in good order; 9 mules, 111 wagons and 4,840 yards of track in use. Monthly shipments are 11,000 tons and value of improvements $150,000; casualties this year was 1 death and 1 injury. Outside temperature 79°, and inside 64°; barometer indications 28 6-10 outside, and 28 6-10 inches inside; condition of air safe.

COLORADO COLLIERY.—*Philadelphia Coal Company, Operators.*

This colliery is situated at Colorado, east of Girardville, upon the estate of the Philadelphia and Reading coal and iron company. It has been 12 years in operation, and consists of 3 drifts, open on the E and D seams, all of which openings are above water line. Three gangways are open, working 8 breasts and robbing out pillars, which work requires skilled miners for that undertaking. Seven gangways are open, in all 5,280 yards in length; 12 breasts are working; the seam is nearly flat and 30 feet thick.

Ventilation is produced by air holes and drift inlets. 181 inside and 150 outside hands are employed; 5 engines of 135-horse, and 6 boilers are used; 26 mules, 180 wagons and 6,300 yards of track are used; 72 houses and 72 families are on the premises; Monthly shipments 14,000 tons and value of equipments is $150,000; only one injury this year.

SHENANDOAH COLLIERY.—*J. O. Rhoades, Operator.*

The colliery is situated at Shenandoah City, upon the estate of the P. R. C. and I. Co., and has been ten years in operation. It consists of a double track slope, sunk 258 yards deep on the south dip of the E vein, at an angle of 20°. The seam is of vast proportions in the basin, of some 300 feet in thickness on this line across its measures. Three gangways are open on each side of the slope—2,250 yards. Eight breasts are worked, with taking out loose coal and robbing pillars. Two veins are worked in connection with the slope, and mining in this place requires skill in the management and practice in the workman.

Ventilation is produced by a 15-horse fan, which appears to be adequate for its purpose. 200 inside and 100 outside hands are employed; 6 steam engines of 226 horse power and 12 boilers are used; 30 mules and 130 wagons are used; 48 houses and families are upon the premises; drainage is a specialty here; value of the improvements is estimated at $200,000; monthly shipments are 10,000 tons; casualties during the year was one death by a fall of coal, leaving a widow and six orphans.

HAZLE DELL COLLIERY.—*Robert Gorrell, Operator.*

The colliery is situated east of Centralia, upon the estate of the Locust Mountain coal and iron company, and has been ten years in operation. It consists of a double track slope, sunk on the north dip of the E vein. Two gangways are open, being 1,500 yards in length. Twelve breasts are working at present, with schutes, &c., and robbing pillars. The seam is 30 feet thick. One out-let is available for miners to travel in.

Ventilation is produced by natural means, as air-holes open directly to the surface. Sixty-five inside and seventy-five outside hands are employed. Complaints concerning ventilation or safety have not come to my notice. Three engines of

150 horse power and 6 boilers are in use, with all their machinery and tackle in good condition. Monthly shipments, —— tons. Value of improvements, $——. Casualties during the year was one death.

BEAVER RUN COLLIERY.—*Peter Bowman, Operator.*

The colliery is situated north-east of Mahanoy City, upon the Delano land company's tract, and has been three years in operation. It consists of a tunnel 186 yards long, opening the D vein at 40 yards, the Six Feet vein at 100 yards, the Seven Feet vein at 230 yards and the Buck Mountain vein at 16 yards. The aggregate length of all gangways open is 1,170 yards, working eight breasts and robbing pillars. 63 inside and 25 outside hands are employed; 7 mules and 27 wagons are used; 2,640 yards of track are used; monthly shipments, 2,000 tons; value of improvements is $——; outside temperature, July 25, was 80° and inside 65°; barometer indication outside was 28¼ and inside 28¼ inches. No fire-damp exists here at present. No other buildings than the breaker and smith shop are on the premises.

EXCELSIOR COLLIERY.—*J. Cleaver, Operator.*

The colliery is situated in Ashland, upon the estate of the P. and R. C. and I. Co., and has been four years in operation. It consists of a slope sunk 80 yards deep on a 6-feet vein. The improvements consist of a small breaker and its attachments. Two gangways are worked some 275 yards long. Seven breasts are open, with extensions, schutes and heading workings.

Ventilation is produced by natural means, which is not adequate to produce a sufficient supply of air at present. 28 inside and 17 outside hands are employed; 2 engines of 45-horse power and 4 boilers are used; 5 mules, 16 wagons and 760 yards of track are used; monthly shipments, 2,000 tons; value of the improvements $10,000; no casualties during the year.

THOMAS COLLIERY.—*Thomas Coal Company, Operators.*

The colliery is situated at Shenandoah, upon the Girard estate, and has been in operation nine years. It consists of a double track slope, sunk 125 yards deep on the E vein. The seam is split by an 18-inch slate seam. The whole vein is 45 feet thick. Two gangways are open some 3,520 yards in length, working 10 breasts and robbing pillars. Five steam engines of 160-horse power and 11 boilers are used, with all their appointments in good order.

Ventilation is produced by a 20-horse fan, the operation of which produces satisfactory results. The colliery is well managed throughout, and the character of work done is safe. 78 inside and 100 outside hands are employed; — mules and — wagons are used; 4,400 yards of track are used; monthly shipments, 8,000 tons; value of improvements, $——; outside temperature, 84°, inside, 65°; barometer indicated 28¼ inches inside and 28¼ inches outside; no casualties occurred during the year.

HILLSIDE COLLIERY.—*George Pomroy, Operator.*

The colliery is situated at Mahanoy city, upon the estate of the P. R. C. and I. Co., and has been four years in operation. It consists of a drift and slope opening. The slope is sunk two lifts in the south dip of the E vein, with two gangways open some 1,110 yards in length. Fourteen breasts, schutes, headings, &c., are worked, the character of which is considered a safe operation. Two safety outlets are available for traveling.

Ventilation is produced by a 20-horse fan and two air-holes, giving satisfactory results. Sixty inside and 25 outside hands are employed; 3 engines of 95-horse and 8 boilers are in use; 7 mules and 24 wagons are used, with 1,740 yards of track. Monthly shipments 2,400 tons. Value of the improvements $——. One person was injured during the year.

TURKEY RUN COLLIERY.—*P. Breneizer & Co., Operators.*

The colliery is situated south of and at Shenandoah city, upon the estate of John Gilbert and others, and is three years in operation. It consists of a tunnel open in south to the E vein. Two gangways of 1,350 yards in length are opened, working 30 breasts, with schutes, heading, &c. The mines are properly managed and the character of work done is safe.

Ventilation is produced by a 20-horse fan and four air-holes, which give satisfactory results. No gases are as yet experienced.

Two steam engines are used = 70 horse, and 4 steam boilers, with all their fixtures are in good order; 137 inside and 107 outside hands are employed; 17 mules and 86 wagons, with 2,600 yards of track are used; outside temperature 78°, inside 64°; barometer outside was 28.4 and inside 28¼ inches. Monthly shipments 11,000 tons. Value of improvements $200,000. One person was injured during the year.

GIRARD MAMMOTH COLLIERY.—*John Donaldson, Operator.*

The colliery is situated at Raven Run, in Schuylkill county, on the Shamokin line of the Lehigh Valley railroad, upon the estate of the Girard heirs, and has been six years in operation. It consists of a tunnel and drift openings, together with a double track slope, sunk 188 yards deep, 65 yards of which are above the tunnel level. 1,600 yards of gangways are open, working 32 breasts, shutes, headings, &c. The character of the work is safe. The mine is properly managed.

Ventilation is produced by 2 furnaces and 3 air out-lets, which furnish a satisfactory supply of air. 66 inside and 95 outside hands are employed; 5 engines of 168 horse power and 4 steam boilers are used; 24 mules and 52 wagons, with 1,800 yards of track, are used; 84 houses and families are on the premises; monthly shipments, 5,400 tons; value of improvements is $——; no casualties occurred during the year.

LOST CREEK COLLIERY.—*Philadelphia Coal Company, Operators.*

The colliery is situated north of Colorado, upon the Philadelphia city tract, and has been five years in operation. It consists of a double track slope, sunk 130 yards deep on the south dip of the E vein. The coal is 40 feet thick. 2,800 yards of gangways are open in two lifts, working 16 breasts, schutes, headings, &c. One safety road is available for miners' use. The character of the work done and management of the mine are excellent.

Ventilation is produced by a 20-horse fan and 4 air out-lets, and produces by this means satisfactory results. 8 steam engines of 400 horse power and 12 boilers are used, with all their appointments in good order and well conditioned; 110 inside and 80 outside hands are employed; 8 steam engines and 12 steam boilers are used; 70 wagons, 15 mules and 3,900 yards of track are used; 52 tenements, occupied by 60 families, are upon the premises; monthly shipments, 12,000 tons; value of improvements, $200,000; one person killed and one injured during the year.

TUNNEL COLLIERY.—*J. K. Seigfried, Operator.*

The colliery is situated at Ashland, upon the estate of the P. and R. C. and I. Co. It has been 15 years in operation. It consists of three slope openings. The old slope is sunk on the north dip of the E vein 268 yards deep. A new hoisting slope and a pump slope have been sunk on the D vein, the seam of which is seven feet thick. The old slope will be used to accommodate the passage of workingmen and material. The colliery and necessary buildings have been remodeled upon a large scale. The coal of the Pioneer colliery will be handled through this, which will constitute a double colliery. The point of concentration of drainage of both collieries will meet at the new pump slope, which lies midway in a territory of 3½ miles in length. The hoisting slope is 230 yards deep, with 40 additional yards up to its landing. The section area is 16+19+8½ feet in clear, with a double track of 40 pound rail, fish-plate jointings and six feet gauge. The supports are of heavy material, massive oak and yellow pine, perfectly in line and symmetry, upon a 58° dip at top to 70° at bottom. The E seam is opened by a tunnel fro n this slope 152 yards in length. Its section area is 15+8. The coal is raised by large boxes—self-dump arrangement. The pump slope is 243 yards deep; top, 16; bottom, 19 and 7 feet high, used for drainage, men and material. 61 yards east of the pump slope a second tunnel, 157 yards in length, opens the E vein. The east gangway is 788 yards long; the west gangway is 877 yards. A solid mass of coal, 357 yards in length, supports the railroad and tenements.

The arrangement for ventilation is complete in its character. 62 breasts are open in the new workings. Two 24-inch column bull pumps are used conjointly, with alternate movement, and may be disconnected for convenience. The present steam power in use at the colliery consists of 2 steam pumps of 125 horse power each and 1 of 125 horse power, all used in the old slope; 1 bull engine, 200 horse power, one 18-inch pump, a 16-inch pump and 10 steam boilers; one 60-horse power hoisting engine, a 20-horse power steam fan and a 12-horse power steam fan. The present owners intend recovering all the coal left in the Pioneer colliery by counter working. The shipping capacity of the tunnel colliery when the present improvements are completed is estimated to supply 150,000 tons for a number of years. The energy with which these improvements are pushed forward is characteristic of General Seigfried's management. The surveys, plans and specifications of the establishment are under the superintendence of General Pleasants, as director general, and of William Kendrick, Esq., as mining superintendent.

CUYLER COLLIERY.—*Heaton & Brothers, Operators.*

The colliery is situated at Raven Run, upon the estate of Girard heirs, and has been 10 years in operation. It consists of drift openings, on the E and D veins. A slope is sunk 221 yards deep, it being 121 yards below water line. Five hundred and two yards of tunneling opens the D and B veins. The length of the main tunnel is 700 yards. Two hundred yards of a tunnel opens the E vein, working 21 breasts, schutes, headings, &c. One thousand two hundred and fifty yards of gangway is opened. The character of work done is safe.

Ventilation is produced by 3 outlet air holes, and operates in a moderate way. No gas has so far been discovered.

Four steam engines=160-horse, and 4 boilers are used; and also a 15-horse steam fan is used is connection with the air holes. Twenty-five mules, 75 wagons and 3,680 yards of track are used; 80 good tenements and 75 families are on the premises; monthly shipment is 6,000 tons; value of improvements is $150,000; casualties during the year was one death; 80 inside and 80 outside hands are employed.

HARTFORD COLLIERY.—*H. Eschelman, Operator.*

The colliery is situated at Mahanoy City, upon the estate of the P. R. C. and I. company, and has been in operation 10 years. It consists of a drift open on the B vein, and another on the E vein; the haulage is one mile per round trip; 2 gangways are open, 1,730 yards in length; 14 breasts are working with schutes, &c; 80 yards of a tunnel opens the D vein; 5,280 yards of track is used in and about the colliery.

The D seam is ventilated by a furnace and an air hole. Not until proper outlets are open can ventilation be a success, however this matter is engaging the attention of Mr. Eschelman, who is prosecuting the improvements with energy. One breaker of 40-horse and 3 boilers are used; 22 wagons, 16 mules and 5,700 yards of track are used; monthly shipments, 2,500 tons; value of improvements, $25,000.

SILLIMAN COLLIERY.—*Romell, Hill & Harris, Operators.*

The colliery is situated a little north of Mahanoy city, upon the estate of the P. and R. C. and I. Co., and has been 10 years in operation. It consists of a new double track slope, sunk 104 yards deep on the south dip of the 7 feet vein, and 3 drifts, all above water level. Three gangways are open some 1,450 yards in length. Thirty-four breasts are working upon the 3 coal seams, with schutes, headings and extensions. The character of the work done is considered a safe operation of its kind.

Ventilation is produced by two 10-horse steam fans placed on the 7 feet vein. their operation produces very satisfactory results. One hundred and thirty-one inside and 58 outside hands are employed. Four steam engines of 140-horse power, 6 good boilers, with all their equipments, are in good condition. Thirteen mules, 38 wagons and 2,780 yards of track are used. Twenty tenements, occupied by 20 families, are upon the premises. The slope has been only 2 years in operation. The upper levels are nearly exhausted of coal. The shipments exceed 7,000 tons per month. Value of the improvements is estimated at $———. Casualties during year was one death.

FOCHT & ALTER COLLIERY.—*Focht & Whittaker, Operators.*

The colliery is situated north of Mahanoy city upon the Delano land Co.'s estate. It has been 8 years in operation. It consists of a double track shaft, opening the B and 7 feet coal seams; 3 gangways are open, 910 yards in length, with 30 breasts working, also schutes, headings and extensions. The coal is 25 feet thick. One good safety road is available for miners. All the work done is considered safe.

Ventilation is produced by a 10-horse steam fan. Its operation gives satisfactory results. Ninety-eight inside and 79 outside hands are employed. Three steam engines are used = 100-horse power, with 4 steam boilers and all their appointments in good condition.

BIG MINE RUN COLLIERY.—*Taylor, Lindsy, & Co., Operators.*

The colliery is situated east of Ashland, and has been now 19 years in operation. It consists of a double track slope and 3 drift levels. The slope is sunk 112 yards deep below water line, on the south dip of the E vein. The coal seam

is 40 feet in thickness. The D vein is worked in this slope by a tunnel. There are 3 drift openings made on the mountain which supply a large amount of coal.

The slope workings are ventilated by means of a 40-horse steam fan, whilst the drifts are ventilated by natural means. The character of work done is principally robbing out the coal from the present lifts.

There are six steam engines = 240-horse power, and 19 steam boilers in use, with all their appointments found in good order. The estate lately came into the hands of the P. and R. C. and I. company, superintended by Wm. Kendrick, Esq., mining superintendent.

STATISTICS *relating to Ashland District collieries for the year ending December* 31, *A. D.*, 1872.

NAMES OF COLLIERIES.	Post office address.	Years in operation	Visits to collieries	Miles traveled.	Handsemployed	Deaths	Maimed	Total casualt's.	Slopes	Shafts	Drifts	Length gangway in y'ds,	Breasts	Fans	Furnaces	Outlets	Ventilation	W'king seams.	Dip of seam south	Dip of seam north
Wm. Penn	Shenandoah	8	3	36	239	1	....	1	....	1	3	2,900	46	20	....	1	Good...	3	....	North
Indian Ridge	Shenandoah	3	3	42	235	2	1	3	....	1	....	950	44	20	....	....	Good...	2	South	.....
Locust Dale	Ashland	18	2	8	116	4	10	14	2	....	....	550	10	20	....	....	Good...	2	South	.....
East Mahanoy	Mahanoy City	8	2	58	177	2	1	3	.....	1	.....	957	30	10	....	....	Good...	3	South	.....
Lehigh, No. 4	Mahanoy City	3	3	62	150	....	2	2	1	.....	.....	725	30	15 15	2	5	Good...	3	South	.....
Knickerbocker	Mahanoy City	9	4	64	143	.....	.....	.. ..	1	....	5	400	32	10	....	1	Good...	1	South	.....
M'Neal, Nos. 1 & 2,	Mahanoy City	8	5	80	540	.....	.....	.....	3	.....	.....	1,732	42	.....	2	7	Good...	6	South	.....
B. M'Neal, No. 3,	Mahanoy City	7	2	40	108	....	.....	....	1	.....	.....	2,640	10	20	....	3	Good...	3	South	.....
Gilbert	Mahanoy City	10	3	48	138	4	4	4	2	....	.....	2,300	53	12	....	....	Good...	2	South	.....
Ellen Gowen	Mahanoy City	10	3	52	233	1	2	3	.....	1	5	3,560	33	.....	2	3	Good...	6	South	.....
Girardville	Girardsville	10	3	24	382	.....	.....	.....	.....	.....	5	6,625	49	.....	.....	3	Good...	5	South	.....
M'Michael	Girardsville	10	2	16	143	1	.....	1	.....	.. ..	4	1,600	15	... .	.....	1	Good...	1	South	.....
Preston, No. 3	Girardsville	10	3	18	45	....	.....	....	1	.....	.....	1,700	4	20	...	1	Good...	1	.....	North
Preston, No. 4	Girardsville	9	3	16	122	....	.....	.....	.....	.....	1	350	8	20	.....	....	Good...	1	.....	North
Keystone	Ashland	10	3	15	176	....	....	.....	2	.....	.....	650	13	40	....	...	Good...	1	.....	North
Union	Ashland	8	3	15	176	....	.....	....	1	.....	1	4,410	10	.....	1	3	Good...	2	.....	North
Malvern	Mahanoy City	8	2	36	90	....	....	.....	.....	.....	1	3,880	12	.....	1	3	Good...	5	South	.....
Copley	Mahanoy City	9	3	42	160	3	1	4	.....	.....	5	630	20	.....	....	3	Good...	2	South	.....
Glyndon	Mahanoy City	9	2	38	109	....	.....	....	1	...	.....	1,000	20	20	....	3	Good...	2	South	.....
Locust Run	Ashland	18	4	16	200	2	....	2	1	.....	....	1,250	7	20	....	3	Good...	1	South	.....
Lehigh, No. 3	Shenandoah	6	2	36	130	3	5	8	1	. ....	2	800	22	20	....	1	Good...	2	South	.....
Continental	Centralia	9	2	10	127	....	.....	....	1	....	....	1,574	68	20	....	1	Good...	1	South	.....
Lilly	Ashland	12	3	12	184	1	2	3	1	.....	2	1,325	74	40	....	1	Good...	3	South	....
Colorado	Colorado	8	3	42	231	.....	1	1	....	.....	2	5,280	12	.....	.....	1	Good...	2	.....	North
Shenandoah City,	Shenandoah City,	10	2	38	300	1	.....	1	1	....	.....	2,220	8	15	.....	....	Good...	2	South	....
Hazle Dell	Centralia	12	3	18	169	1	....	1	1	.....	.....	1,500	12	.....	....	2	Good...	1	.....	North
Beaver Run	Mahanoy City	3	2	56	88	....	.....	.....	.....	....	1	1,170	8	.....	.....	1	Good.	4	.....	North
Excelsior	Ashland	4	4	8	45	.....	.....	...	1	.....	.....	275	7	.....	.....	1	Good.	1	South	.....
Thomas	Shenandoah	6	2	36	178	....	....	.....	1	....	.....	3,520	10	20	.....	2	Good.	1	South	.....
Hill Side	Mahanoy City	4	1	26	80	....	1	1	1	.....	.....	1,110	14	20	....	1	Good.	2	South	.....
Turkey Run	Shenandoah City,	3	2	32	248	.....	1	1	.....	.....	1	1,350	80	20	.....	4	Good...	1	South	.....

Girard—Mam'th	Girardville	6	2	28	155				1		2	1,600	32			3	Good	2	South	
Lost Creek	Colorado	8	2	24	190				1			2,800	16	20		4	Good	1	South	
Tunnel	Ashland	15	8	6	90	1	1	2	3			1,700	77	20 40		3	Good	2		North
Cuyler		10	2	24	160	1		1	1		2	1,250	21	15		3	Good	3	South	
Hartford		8	2	80	68						3	1,730	14		1	3	Good	3		North
Primrose		9	4	100	154	1	2	3	1		2	3,720	34	10	1	5	Good	3	South	
Mahanoy City		10	2	48	186		6	6	1		5	1,027	30	15	1	3	Good	5	South	
St. Nicholas		10	3	60	157		6	6	1			1,655	104	16		8	Good	5	South	
Delano		6	3	78	134				1		1	555	15	15	1	4	Good	3		North
Suffolk		8	3	54	133				1		3	7,998	30	10		3	Good	4	South	
Stanton		2	4	48	158				1			350	4	30		1	Good	1	South	
Lawrence		4	4	48	148				1			1,400	64	30		1	Good	1		North
Bear Ridge		8	2	26	29				2			300	14	20		1	Good	2	South	
Hon'y Brook, Nos. 1, 2, 3 and 4		6	2	60	560	2		2	4			2,000	100		5	16	Good	2	South	North
Cambrian		3	3	10	60	1	13	14	2			650	4	20		1	Good	1	South	
Plank Ridge		10	2	36	279		13	13	1	1		2,400	40		1	1	Good	2	South	
Grant		10	2	56	91						2	1,476	24		1	3	Good	3	South	
West Lehigh		3	3	32	116	2		2	1		1	1,000	25	10	2	3	Good	4	South	
Preston, Nos. 1 & 2,		12	6	48	215				1		2	5,280	15	60		3	Good	3	South	
Boston Run		6	4	56	188	1	3	4	1			1,800	18	20		1	Good	3		North
Bear Run		10	3	48	141				1			2,000	17	10		3	Good	6	South	
Furnace		4	3	40	65						2	2,000	4		1	3	Good	2	South	
Draper		9	3	48	220				2			1,600	13	20		3	Good	1		North
Girard		10	3	36	230	1		1		1		1,600	3	40		1	Good	2		North
Coal Ridge		19	2	26	306				1			3,080	18			3	Good	2	South	
Kohinoor		3	3	54	300	3	5	8		1		1,500	77	20			Good	2	South	
Tunnel Ridge		11	2	44	215				1		1	1,966	121	20		3	Good	2		North
Elmwood		2	2	44	40	1	1	2	1		1	350			1	1	Good	2	South	
Big Mine Run		18	3	12	120				1		2	1,500	20	40			Good	3	South	
*Eagle, (Col. Co.,)		12	2	12	96						2							2	South	
Silliman		10	2	52	220	1		1	1		3	1,450	34	20 20		4	Good	3	South	North
Mahanoy		10	2	52	120							2,000						2	South	
†Centralia		14																		
Hoffman		9	2	60	170						3									
†Trenton		8																		
†New Boston		1	1		200															
†Silver Brook		10	1	44	200					1										

*Destroyed by fire. †Suspended operation.

STATISTICS *relating to Ashland District collieries—Continued.*

NAMES OF COLLIERIES.	Post office address.	No. of engines.	Horse-power ...	Boilers	Temp'ture outside, degrees,	Temp'ture inside, degrees,	Barometer outside	Barometer inside	Sort of gas	Yards of track,	No. of mules...	No. of wagons ..	Tenements.....	Families	Monthly shipments in tonnage	Value of the improvem'ts by estimation.....
Wm. Penn...	Shenandoah	6	275	8	60	65	29½	29.7	Fire....	4,400	16	75	80	100	8,500	200,000
Indian Ridge.....	Shenandoah	8	300	10	60	65	29.3	29.5	Fire....	1,000	14	60	.....	.....	8,000	200,000
Locust Dale.....	Ashland.....	7	760	16	50	64	.....	.....	Fire....	2,000	11	62	140	130	3,000	200,000
East Mahanoy....	Mahanoy City.....	3	100	4	40	50	.....	.....	Fire....	1,800	9	53	2	2	8,000	100,000
Lehigh, No. 4	Mahanoy City.....	7	268	19	45	50	.....	.....	Fire....	2,500	14	44	50	40	3,000	100,000
Knickerbocker ...	Mahanoy City.....	6	190	9	40	51	.....	.....	Fire....	1,730	20	77	60	80	6,000	50,000
M'Neal, Nos. 1&2,	Mahanoy City.....	7	255	19	.....	.....	.....	.....	Fire....	5,280	25	83	180	160	16,000	500,000
B. M'Neal, No. 3..	Mahanoy City.....	3	120	7	.....	.....	.....	.....	Fire....	2,800	10	40	.....	.....	6,000	40,000
Gilbert	Mahanoy City.....	6	541	14	63	66	28	28.1	Fire....	4,440	26	60	80	80	10,000	300,000
Ellen Gowen	Mahanoy City.....	3	100	12	64	66	28	28.1	Fire....	15,780	30	100	90	100	10,000	120,000
Girardsville.....	Girardsville	6	160	5	53	56	28	28	Fire....	6,500	45	110	102	120	16,000	200,000
M'Michael.....	Girardsville	3	70	4	.....	.....	.. ...	.....	Fire....	2,500	5	26	.....	.....	7,000	110,000
Preston, No. 3.....	Girardsville	2	80	3	60	64	28½	28.6	Fire. ..	6,170	6	40	26	26	6,000	200,000
Preston, No. 4.....	Girardsville	2	50	4	...	.....	.....	.....	Fire....	4,000	8	40	26	26	5,000	100,000
Keystone	Ashland.....	9	405	23	80	70	28½	28.7	Fire....	2,690	18	40	48	42	5,000	150,000
Union	Ashland.....	3	74	4	.....	.....	.....	.....	Fire....	6,170	18	60	14	14	9,000	....
Malvern.....	Mahanoy City.....	2	40	3	80	70	28	28½	Fire....	4,180	17	60	15	15	6,000	....
Copley.....	Mahanoy City.....	2	60	6	.....	.....	.....	.....	Fire....	2,700	22	62	11	11	9,000	70,000
Glyndon.....	Mahanoy City.....	4	95	7	76	60	28½	28½	Fire....	1,300	8	30	8	8	3,200	50,000
Locust Run.....	Ashland	8	525	22	80	70	28½	28.6	Fire....	1,500	15	40	8	8	9,000	150,000
Lehigh, No. 3.....	Shenandoah.....	4	146	8	80	70	28½	28.6	Fire....	1,780	8	20	18	18	6,500	....
Continental.....	Centralia	6	290	13	80	60	28	28	Fire....	2,000	14	38	25	25	9,000	200,000
Lilly..	Ashland.....	7	880	16	76	64	28.6	28.8	Fire....	4,840	9	111	22	18	11,000	150,000
Colorado.....	Colorado.....	5	135	6	.....	.....	.....	.....	Fire....	6,300	26	180	72	72	14,000	....
Shenandoah City,	Shenandoah City..	6	226	12	.....	.....	.....	.....	Fire....	2,620	30	130	48	48	10,000	200,000
Hazle Dell.....	Centralia..	6	385	14	.....	.....	.....	.....	Fire....	8,294	15	47	30	30	10,000	....
Beaver Run	Mahanoy City.....	1	30	2	80	65	28½	28½	Fire....	2,640	7	27	.....	.....	2,000	....
Excelsior..... ..	Ashland	2	45	4	.....	.....	.....	.....	Fire....	760	5	10	.....	.....	2,000	10,000
Thomas.....	Shenandoah.....	5	160	11	.....	.....	.....	.....	Fire....	4,400	12	40	26	26	10,000	....
Hill Side.....	Mahanoy City	3	95	8	.....	.....	.....	.....	Fire....	1,740	7	24	2	2	2,400	....
Turkey Run.....	Shenandoah City..	2	70	4	78	64	28½	28½	Fire....	2,600	17	36	2	4	11,000	200,000
Girard—Mam'th..	Girardsville	5	168	4	.....	.....	.....	.....	Fire....	1,800	25	52	80	75	6,000	150,000

Lost Creek	Colorado	8	400	12					Fire	3,900	15	70	50	60	12,000	200,000
Tunnel	Ashland	10	1,795	20					Fire	2,550	8	21	50	50	2,000	350,000
Cuyler		4	160	4					Fire	3,680	25	75	80	75	6,000	155,000
Hartford		1	40	4					Fire	5,700	16	32	1	1	2,500	
Primrose		5	165	6	80	65	28½	28½	Fire	4,160	12	42	31	31	7,000	150,000
Mahanoy City		4	165	6	65	60	29	29	Fire	1,000	16	50	24	24	12,000	150,000
St. Nicholas		5	275	14	55	50	28	28	Fire	2,880	20	[illegible]	40	60	12,000	250,000
Delano		3	95	9	51	60			Fire	2,986	8	30	1	1	3,000	80,000
Suffolk		2	45	4					Fire	8,998	20	56	75	75	3,000	180,000
Stanton		3	155	6	71	60			Fire	1,810	6	21			8,000	40,000
Lawrence		4	170	9	49	61			Fire	2,410	12	35	4	4	8,000	120,000
Bear Ridge		7	585	20					Fire	840	10	40	50	55		150,000
Honey Brook, Nos 1, 2, 3 and 4		13	735	31					Fire	6,000	31	200	100	100		
Cambrian		3	130	7					Fire	1,000	3	20	4	4	4,000	100,000
Plank Ridge		10	840	12	59	62	29.3	29.1	Fire	10,350	27	111	17	17	12,000	210,000
Grant		2	55	4	44	50			Fire	2,000	8	24	1	1	1,000	50,000
West Lehigh		5	170	9					Fire	1,200	15	45	30	30	5,000	50,000
Preston, No. 1 & 2,		7	290	16					Fire	7,040	30	80	52	52	10,000	150,000
Boston Run		6	180	10	56	60			Fire	2,000	8	55	50	50		150,000
Bear Run		6	395	14					Fire	3,000	14	52	60	60		150,000
Furnace		1	25	2					Fire	2,225	11	30	24	24	3,400	32,000
Draper		9	450	19					Fire	2,400	13	50	62	70	10,000	150,000
Girard		5	240	14	44	52	29	29.3	Fire	2,225	40	75	44	44	6,000	100,000
Coal Ridge		6	555	12	64	68	29	29	Fire	4,000	19	33	103	103	6,000	100,000
Kohinoor		7	211	8					Fire	1,655	16	98	26	26	9,000	220,000
Tunnel Ridge		7	314	12	64	69	28	28½	Fire	4,130	22	40	46	46	9,100	160,000
Elmwood		4	150	6	70	60	28½	28½	Fire	500	7	40	18	18	1,200	75,000
Big Mine Run		6	240	19	71	62	28½	28.6	Fire	1,200	10	45	16	16	3,000	
*Eagle, (Col. Co.,)		1	25	2					Fire							
Silliman		4	140	6					Fire	2,780	13	38	20	20	7,000	150,000
Mahanoy		2	46	4												
†Centralia		5	370	12												
Hoffman		4	150	8												
†Trenton		4	160	8												
†New Boston		4	170	13						1,200	8	46	16	16		
†Silver Brook		4	265	11												

*Destroyed by fire. †Suspended operation.

SHAMOKIN DISTRICT.

List of names of persons who were killed, and those who died of injuries in the Third or Shamokin district during the year ending December 31, A. D. 1872.

Date.	Names of persons killed.	Names of the collieries.	Wife.	Orph.	Character of casualties.
Jan. 1	Henry Beyerly	Montillius	1	2	Suffocated in a breast by noxious gas.
April 1	James Tones	Colkett	.....	.....	Died of injuries sustained in the mines.
3	Edward Downes	Big Lick	1	4	Killed by a fall of rocks.
10	Daniel Miller	Williamstown	1	.....	Killed—run over by a wagon on the planes.
23	John Moor	Williamstown	.....	.....	Killed by a fall of rocks.
23	John M'Cann	Williamstown	.....	.....	Killed by a fall of rocks.
23	Frederick Hilderline	Williamstown	.....	.....	Killed by a fall of rocks.
25	John Minahan	Otto Red Ash	.....	.....	Killed by an explosion of gas.
May 8	James Shirran	Black Diamond	1	6	Killed by a wagon in the slope.
24	James Deggan	Excelsior	.....	.....	Killed by a fall of coal.
27	Casmer Ratvstiki	Burnside	1	6	Killed by a fall of coal.
June 4	Isaac Meyers, boy	Williamstown	.....	.....	Killed—run over by a wagon on the plane.
5	Thomas Monaghan	Colkett	1	8	Killed by a fall of coal.
12	James Harris, boy	Cameron	.....	.....	Killed by a fall of slate.
July 12	Thomas Earls, boy	Brookside	.....	.....	Killed by wagons in the gangway.
13	Frank Casterline, boy	Big Lick	.....	.....	Killed by falling off the dirt bank.
19	Michael Ford	Rauch Creek	.....	.....	Killed by a fall of rocks.
23	John Wise, boy	Daniel Webster	.....	.....	Killed in the breaker rollers.
Aug. 14	John Culbert, boy	Lower Rauch Creek	.....	.....	Killed by an explosion of gas.
14	Richard Culbert, boy	Lower Rauch Creek	....	....	Killed by an explosion of gas.
15	Charley Whittle	Williamstown	1	7	Killed by a fall of coal.
Sept. 18	John Cunningham	Otto Red Ash	1	5	Died—effects of an explosion of gas.
27	John Thomas	Diamond	1	4	Died—effects of an explosion of gas.
Oct. 14	James Murry, boy	Diamond	.....	.....	Died—effects of an explosion of gas.
14	John Eddy	Buck Ridge	1	2	Killed by a fall of coal.
17	John Edwards, boy	Mount Carmel	.....	.....	Killed by a fall of coal.
Nov. 8	Thomas Keatting, boy	Otto Red Ash	....	.....	Died—burnt by gas.
8	Henry Beese	Otto Red Ash	1	2	Died—burnt by gas.
8	Bartley Conners	Mount Carmel	1	6	Died—burnt by an explosion of powder.
Dec. 13	Edward Jones	Daniel Webster	...	.....	Died—burnt by an explosion of gas.
13	Peter Krebs	Straw	1	.....	Killed in the slope by a fall of coal.
15	An unknown man	Shamokin	....	.....	Died after being injured. Supposed to be a Pole.

32 persons died during the year.

SHAMOKIN DISTRICT.

List of names of persons that were maimed and injured in the mines of this district during the year ending December 31, A. D. 1872.

Date.	Names of persons injured.	Names of the collieries.	Remarks.
Mar. 12,	J. Raudabush....	Otto Red Ash.....	Severely burnt by an explosion of gas.
12,	John Larkin.....	Otto Red Ash.....	Severely burnt by an explosion of gas.
12,	John Griffith... .	Otto Red Ash.....	Severely burnt by an explosion of gas.
12,	David Davis.	Otto Red Ash.....	Severely burnt by an explosion of gas.
12,	John Kavanagh..	Otto Red Ash.....	Severely burnt by an explosion of gas.
12,	John Thomas.....	Otto Red Ash.....	Severely burnt by an explosion of gas.
20,	Thomas Fannon,	Phœnix No. 2.....	Severely burnt by an explosion of gas.
20,	John O'Neil.....	Phœnix No. 2.....	Severely burnt by an explosion of gas.
Apr. 4,	Dan Miller	Williamstown....	Mortally injured by wagons.
4,	Lyb. F. Nolan ...	Williamstown....	Severely burnt by gas.
4,	Storis Waldron..	Henry Clay	Severely injured by a fall of slate.
4,	John Helper	Henry Clay	Severely injured by a fall of slate.
4,	Joseph Merkle...	Stuartsville.....	Severely injured by powder.
8,	Samuel Hearter..	Colkett..	Severely injured by an explosion of gas.
8,	James Sheehan..	L. Rauch Creek..	Severely injured by an explosion of gas.
10,	John Shaeffer.....	Red Mountain ...	Severely injured by fall in the slope.
10,	A miner.....	Franklin	Severely burnt by an explosion of gas.
17,	John Kennedy...	L. Rauch Creek..	Severely burnt by an explosion of gas.
29,	Evan Argust	Otto Red Ash.....	Severely burnt by an explosion of gas.
29,	Evan Reese..	Otto Red Ash.....	Severely burnt by an explosion of gas.
29,	John Prichard ...	Otto Red Ash.....	Severely burnt—arm broken by explosion of gas.
29,	David Davis.....	Otto Red Ash.....	Severely burnt by an explosion of gas.
29,	Benj. Argust	Otto Red Ash.....	Severely burnt by an explosion of gas.
29,	Patrick Canniff..	Otto Red Ash.....	Severely burnt by an explosion of gas.
29,	Daniel Colvy	Otto Red Ash.....	Severely burnt by an explosion of gas.
29,	Martin Kelly.....	Otto Red Ash.....	Severely burnt by an explosion of gas.
29,	Frank Kearns.....	Otto Red Ash.....	Severely burnt by an explosion of gas.
29,	James Joyce	Otto Red Ash.....	Severely burnt by an explosion of gas.
29,	John M. Kelly...	Otto Red Ash.....	Severely burnt by an explosion of gas.
29,	Joseph Schock...	Enterprise	Severely injured by a fall of coal.
30,	Patrick Keating..	Colkett..	Seve'ly inj'ed by an explosion of powder.
30,	Charley Miller...	L. Rauch Creek..	Leg injured—run over by a wagon.
May 1,	John Roberts.....	Colkett..	Mortally injured by a blast.
1,	John B. Wright..	Tremont	Severely injured by wagons.
8,	Chas. Freeman...	Otto White Ash..	Arm broken—fell down a breast.
8,	E. P. Foulk.. ..	Shamokin.	Ribs broken—fell down a breast.
9,	Henry H. Helt...	Shamokin.	Crushed by wagons in the mines.
22,	Alick Keser.....	Williamstown....	Severely injured by a fall of rocks.
22,	John Jones..	Williamstown....	Severely injured by a fall of rocks.
29,	Chas. Newman...	Luke Fidler.....	Hand cut off by a fall of coal.
June 5,	Samuel Schell ...	Colkett.....	Eyes destroyed by a blast.
5,	J. Stitzman..	Colkett.....	Injured by the blast.
13,	Hugh Golden.....	Otto Red Ash.....	Severely burnt by an explosion of gas.
13,	Uriah Brown.....	Otto Red Ash.....	Severely burnt by an explosion of gas.
13,	Alfred DeLong...	Luke Fidler.....	Leg broken by a fall of coal.
13,	Martin Madera...	Hickory Swamp,	Arm broken by a dirt car.
July 19,	J. W. Thomas....	Big Lick	Arm broken by a fall of coal.
19,	The engineer.....	Eagle No. 2..	Severely scalded by a boiler explosion.
20,	Philip Imswiller	Colkett...	Severely burnt by gas.
25,	John Dolan.. . ..	Cameron	Eyes destroyed by explosion of powder.
Aug. 5,	Robert Parkins..	Buck Ridge..	Head severely injured by powder.
9,	Jacob Daubler....	L. Rauch Creek..	Severely injured by an explosion of gas.
12,	Jacob Koroeskia,	Bear Valley.....	Severely injured by an explosion of gas.
12,	W. Lindemuth..	Bear Valley..	Severely injured by an explosion of gas.
14	Richard Culbert,	L. Rauch Creek..	Mortally injured by an explosion of gas.
17,	Christ Rohrbach	Colkett.....	Head injured by an explosion of blast.
23,	William Kyle....	L. Rauch Creek..	Severely burnt by an explosion of gas.
23,	Wm. Kyle, Jr....	L. Rauch Creek..	Severely burnt by an explosion of gas.
23,	Daniel Harvey..	L. Rauch Creek.	Severely burnt by an explosion of gas.
29,	A boy..	Otto Red Ash.....	Leg cut off by a dirt car
30,	Jas. Kellegher...	Diamond No. 2....	Ribs broken by a fall of coal.
31,	Daniel Crow	Big Lick...	Leg broken by a dirt car.

SHAMOKIN DISTRICT—*Continued.*

Date.	Names of persons injured.	Names of the collieries.	Remarks.
Sept. 18,	Pat. M'Garvey...	Otto Red Ash.....	Severely burnt by an explosion of gas.
18,	Richard James...	Otto Red Ash.....	Severely burnt by an explosion of gas.
18,	David James.. ..	Otto Red Ash.....	Severely burnt by an explosion of gas.
18,	J. Cunningham..	Otto Red Ash.....	Mortally burnt by an explosion of gas.
18,	Patrick Quinn...	Otto Red Ash.....	Seriously burnt by an explosion of gas.
18,	James Howells...	Otto Red Ash.....	Seriously burnt by an explosion of gas.
18,	Jacob Gehress....	Otto Red Ash.....	Seriously burnt by an explosion of gas.
19,	A Polander.....	Buck Ridge.....	Seriously injured by a fall of rocks.
27,	J. Prenderghast,	Diamond, No. 2,	Severely injured by an explosion of gas.
27,	John Thomas.....	Diamond, No. 2,	Mortally burnt by an explosion of gas.
27,	Jas. Murry, boy,	Diamond, No. 2,	Mortally burnt by an explosion of gas.
Oct. 11,	Michael Tice.....	Williamstown....	Severely injured.
11,	Edwards, boy.....	Mt. Carmel..... ..	Mortally injured by a fall of coal.
11,	A workingman ..	Mt. Carmel...	Mortally injured by a fall of coal
23,	John W. Rush...	Williamstown....	Severely injured—fell off a building.
23,	John Schmidt....	Henry Clay.....	Leg lacerated by the elevator.
29,	M. Dauglas...	Big Lick.....	Severely burnt by gas.
29,	Wm. Barnes.....	Mt. Carmel.....	Scull fractured by a piece of coal.
29,	A miner.....	Mt. Carmel.....	Leg badly cut by a piece of coal.
29,	James Harris.....	Mt. Carmel.....	Severely injured by a shot.
29,	Anthony Nary...	Mt. Carmel.....	Hand injured by a fall of coal.
Nov. 2,	John Dooley	Locust Mt. C. Co.	Severely burnt by powder.
2,	John Morrison...	Coal Mountain...	Foot badly crushed in the rollers.
4,	James Kelly.....	Diamond.....	Run over by wagons.
Dec. 3,	Edward Jones ...	Daniel Webster,	Dangerously burnt by powder.
7,	Patrick Martin...	Short Mountain..	Arm broken by fall of coal.
7,	Dan. Kelly.....	Short Mountain..	Dangerously injured by the slope rope.

Eighty-nine persons were injured as per report, and thirteen persons whose names had not been ascertained, making a total of one hundred and two persons injured.

SHAMOKIN DISTRICT.

COAL TONNAGE FOR THE YEAR 1872 WAS 2,425,431 TONS.

No.	Names of collieries.	Location.	Names of land owners.	Names of operators.	Shipments.
1...	A. S. Wolf	Locust Gap	L. Gap Coal and Iron company	Kimble & Graber	50,982
2...	Stuartville	Mount Carmel	Mt. Carmel Coal and Iron company,	William Montilius	91,560
3...	Buck Ridge	Shamokin	L. Gap Iron and Coal company	May and others	89,384
4...	Luke Fidler	Shamokin	Burnside Coal company	Mineral Railroad and Mining Co	76,812
5...	Cameron	Trevorton	P. and R. and L. V. Railroad Cos	Mineral Railroad and Mining Co	76,510
6 .	Hickory Swamp	Shamokin	Northern Central Railroad Co	Mineral Railroad and Mining Co	49,236
7...	Big Mountain	Shamokin	B. Mountain Improvement Co	J. Langdon & Co	67,924
8...	Burnside	Shamokin	B. Mountain Improvement Co	May & Co	66,109
9..	Reliance	Shamokin	Mt. C. and L. Mt. Coal and Iron Co.	Baumgardner & Co	65,794
10...	Henry Clay, No. 1, 2	Shamokin	Fulton Coal company	Guiterman and others	64,220
11...	Bear Valley	Carbon Run	Carbon Run Improvement Co	Goodwill & Co	61,721
12...	Trevorton	Trevorton	P. and R. and L. V. Railroad Cos	N. Franklin Coal company	59,284
13...	Monitor	Locust Gap	Locust Gap Improvement Co	G. W. John & Brother	58,185
14...	Locust Gap	Locust Gap	Locust Gap Improvement Co	Kimble & Graber	54,883
15...	Excelsior	Shamokin	Fulton Coal company	Excelsior Coal and Mining Co	51,617
16...	Coal Ridge	Mount Carmel	C. R. Coal and Iron company	Barton & Brothers	50,698
17...	Ben Franklin	Helfenstein	Helfenstein & Brothers	R. B. Douty	27,743
18...	Greenback	Shamokin	Fulton Coal company	Guiterman & Gorman	25,537
19..	Hickory Ridge	Shamokin	Northern Central Railroad Co	J. Langdon & Co	23,882
20...	Enterprise	Shamokin	Enterprise Coal company	Enterprise Coal company	23,600
21...	Shamokin	Shamokin	Hays, Kelso & Keller	Weaver & Martin	22,804
22...	Helfenstein	Helfenstein	Helfenstein & Brothers	Fegley & Co	21,845
23...	Coal Mountain	Stuartville	Susquehanna and Coal Mt. Coal Co.	Rhoades and others	14,9 1
24..	Daniel Webster	Shamokin	Northumberland Land association	William Brown	14,843
25...	Lambert	Shamokin	Shamokin Coal company	William Brown	13,627
26...	Morton	Shamokin		A. Morton	12,897
27...	Caledonia	Shamokin	Henry Saylor	Schwenk & Co	8,177
28...	Franklin	Helfenstein		Haas and others	7,135
29...	Frank Gowen	Helfenstein	Bells heirs	Shipp & Co	5,920
30...	Marshall	Helfenstein	Northumberland Land association	Heim & Co	5,207
31...	George Fales	Helfenstein	Fulton Coal company	Reese & Brothers	6,097
32...	Lancaster	Shamokin	Northern Central Railroad Co	Smith & Keiser	2,141
33...	Locust Summit	Shamokin	Locust Summit Coal company	Carter & Gorman	863
34...	Margie Franklin	Shamokin	Fulton Coal company	Enterprise Coal company	85
35...	Brady	Shamokin	Fulton Coal company	Guiterman & Gorman	20

SHAMOKIN DISTRICT—CONTINUED.

No.	Name of collieries.	Location.	Names of land owners.	Names of operators.	Shipments.
.....	.....	.....	.....	Miscellaneous	18
36..	Miriam..	Locust Gap..	P. R. Coal and Iron company.	Locust Dale Coal company..	14,883
37...	N. Franklin	Helfenstein.	Helfenstein & Brothers..	Gordon & Smith	24,122
38...	Brookside	Brookside	Monson & Williams	Gordon & Repplier..	50,891
39...	Black Diamond.	Locust Summit..	Locust Summit Coal company..	W. H. Schmoeley	1,654
40...	Big Lick.....	Williamstown	Lykens Summit Coal company.	Lykens Summit Coal company.	130,000
41 ..	Colkett..	Donaldson	Tremont Coal company.	Colkett and others	63,487
42...	Diamond	Forestville...	P. R. Coal and Iron company.	J. Wadlinger..	33,972
43...	Eckel	Donaldson	Tremont Coal company.	Owen, Eckel & Colkett..	564
44...	Franklin (Schuylkill)...	Strongville..	P. R. Coal and Iron company.	William Kendrick..	73,896
45...	Kalmia.....	Paul Valley.	Fishing Creek Coal company..	Phillips & Sheafer.....	22,022
46...	Lower Rauch Creek	Rauch Creek...	Swatara Coal company...	Miller, Graff & Co.....	117,713
47...	Lincoln	Lorberry	Swatara Coal company...	Levi Miller..	40,592
48...	Otto, Nos. 1, 2 and 3.....	Branch Dale	P. R. Coal and Iron company.	William Kendrick.....	71,325
51...	Phœnix, No. 1	Phœnix Park..	P. R. Coal and Iron company.	William Kendrick.....	19,601
52...	Phœnix, No. 2	Phœnix Park.....	P. R. Coal and Iron company.	William Kendrick...	829
53...	Short Mountain.....	Williamstown...	Lykens Summit Coal company.....	Lykens Summit Coal company.....	100,328
54...	Swatara.....	Swatara.....	Swatara Coal company...	Claud White, agent.	8,504
55...	Straw..	Swatara.	Swatara Coal company...	Winlack and others	577
56...	Tower City.....	Tower City..	Monson & Williams	Gordon & Repplier..	82,696
57...	Tremont	Tremont	Tremont Coal company.	Fisher and others..	3,249
58...	Williamstown.	Williamstown	Lykens Summit Coal company.....	Lykens Summit Coal company.....	260,000
59...	West End	Donaldson	Tremont Coal Company.	Owen, Eckel & Colkett.....	561
60...	White	Donaldson.....	Tremont Coal Company.	J. C. White.	299
				Miscellaneous	1,318

REPORT

OF THE

INSPECTOR OF COAL MINES IN THE SOUTHERN DISTRICT OF LUZERNE AND CARBON COUNTIES, FROM DECEMBER 31, 1871, TO DECEMBER 31, 1872.

JOHN T. EVANS, INSPECTOR OF COAL MINES.

To His Excellency JOHN F. HARTRANFT,
Governor of the State of Pennsylvania.

HON. SIR:—Conformably with the requirements of the law, I have the honor of submitting to you my annual report, as Inspector of Coal Mines in the district of Southern Luzerne and Carbon counties. I feel happy that I am able to report a diminution in the list of fatal accidents compared with that of the year 1871. In my report for 1871, it will be found that the number of fatal accidents were 29 to 2,500,000 ton of coal, or one to every 86,207 tons of coal. The number of fatal accidents for 1872, are 25 to 3,500,000 tons of coal, or one to every 140,000 tons of coal raised, which shows a decrease of 4 in the number of fatal accidents; notwithstanding that 1,000,000 tons of coal more were mined during the year 1872.

The following table will show you the number and cause of these accidents:

By fall of coal	14
Explosion of powder	1
Cars inside	3
On slopes	1
Fall of roof	1
Premature blast	2
Falling of gauff	1
Falling into breaker rollers	1
Fire-damp	1
Total	25

In the list of accidents not being fatal, I have the unpleasant duty to report an increase of two over that of the year 1871. The number of accidents in my last report was 36 to 2,500,000 tons of coal, or one to every 69,444 tons, 16 cwt., while the number for 1872 is 38 to 3,500,000 tons, or one to every 92,105 tons, 10 cwt., of coal raised. Comparing it with the amount of coal mined, it is really a decrease, as the above figures show, still it would have been a great satisfaction to me to be able to report a diminution in the number of accidents. It is almost a proverbial saying in these coal regions, "that accidents will occur." This has its effect upon those who have charge of mines, and it even makes the men more careless. It seems something singular to me, how the recurrence of accidents takes away the horror connected with such events. It is nothing uncommon when a poor fellow hath a limb fractured, to hear his fellow-laborers saying, "oh, he got off very well, only a limb or arm fractured." In comparison with life, he might have "got off very well," but it is something for a man to loose a limb and be disabled perhaps for life. I am anxious to see the day, when both employer and employed will use every means and precaution, in order, if possible, to do away entirely with accidents. I am perfectly satisfied that the inspection of mines will in course of time, have a very beneficial effect on the health and comfort of the miners and all concerned.

Ventilation is improving throughout the whole of my district. Should improvements be made in the future to the same extent as the last few years, those that are young to-day in the mines, will enjoy happier days in their old age than the old miners of to-day. The old miners of to-day are with very few exceptions asthmatic, which is owing to bad ventilation, but those days are fast passing away, and the miner having the pleasure of working in purer air, which will have a beneficial effect upon the general health of the miner.

There has not been a single instance of boiler explosion, nor a rope broke to injure any one. I have made it a specialty to see that the ropes are good, and that boilers are kept in perfect order, by compelling each company to report state of boilers semi-annually according to law, and oftener when I doubt them. Things are not yet as I would wish them to be. It requires time to have things to perfection. Full and cordial co-operation of both those in charge of mines and miners is necessary to bring full and perfect safety of health, life and prosperity.

I have been obliged to summon one before a justice of the peace for violation of the law which forbids riding on loaded cars in slopes and shafts, and it is probable that more are guilty of the same offense, but I have succeeded in detecting but one. I am doing and will do all within my power to prevent any violation of the law in this respect. Besides the general report, accompanying it you will find a list of every fatal accident with a short sketch of each; also a list of accidents not proving fatal, together with a table, giving location of collieries, land owners, operators and coal shipped during the year 1872.

DAMAGES TO PROPERTY.

One slope was destroyed at Stockton, Luzerne county, by a crush. This occurred owing to working too near the slope or taking away the slope pillars some years ago by former operators in the first and second lift of No. 1.

Breaker burned down at Ebervale, Luzerne county. The fire in No. 6 Tunnel, Summit Hill, Carbon county, continues to burn, but has not broke out to the surface. The company is preparing to dam the works, so as to fill them with water, and I hope that they will be successful in extinguishing the fire.

List of fatal accidents in South district, Luzerne and Carbon counties.

[Total deaths 25.—Widows, 11; Orphans, 33.]

1872.	Location.	No. of slopes.	No. of tunnel.	Names.	Married or single.	Age.....	No. of children.	How killed.	Remarks.
January 5,	Stockton	3	.....	George Wills	M.	35	3	Fall of coal	Instant death.
" 10,	Upper Lehigh	.....	.....	John Wigand	S.	21	.....	Cars, outside	do.
" 18,	Buck Mountain	2	.....	James Malley	S.	20	.....	Burnt by powder	Lived 5 days.
February 9,	Woodside	1	.....	Jas. G. Marshall	S.	18	.....	Cars, inside	Instant death.
" 10,	Hazleton, old slope	.....	.....	A. Gaitenhozer	M.	52	.....	Car on slope	do.
March 27,	Yorktown	1	.....	Andrew O'Donald	M.	50	7	Fall of coal	do.
" 27,	Yorktown	1	.....	James Swinney	M.	35	2	do do	do.
April 10,	Stockton	2	.....	Wm. Morrish	M.	50	1	do do	do.
" 11,	Cranberry slope, Hazleton,	.....	.....	Jas. Boyle	S.	18	.....	do do	do.
June 12,	Buck Mountain	4	.....	Jno. Gallagher	S.	22	.....	do do	do.
" 18,	Eckley	4	.....	Francis Ward	S.	22	.....	do do	do.
" 14,	Summit Hill	4	.....	Reuben Canera	S.	20	.....	Cars, inside	Lived 1 day.
July 11,	Tresckow	5	.....	Arch. Williams	S.	19	.....	By coal	Lived 14 days.
August 1,	Yorktown	1	.....	Ed. Harkin	M.	.....	3	Fall of slate	Instant death.
" 3,	Hazleton, Laurel Hill slope,	.....	.....	John Ward	S.	32	.....	Fall of coal	do.
" 8,	Summit Hill	.....	5	Thos. T. Williams,	M.	70	.....	Premature blast	do.
" 19,	Lattimer	2	.....	Jenkin Rosser	M.	27	2	do do	Lived 4 days.
October 14,	Eckley	2	.....	Frederick Hinder,	S.	23	.....	Gauff fell on him	Instant death.
" 18,	Coleraine	.....	1	Thomas Boyle	S.	18	.....	Cars, inside	do.
" 19,	Hazleton	.....	.....	Charles Depuey	S.	13	.....	Breaker rollers	do.
" 22,	Coleraine	1	.....	Charles Paul	W.	45	6	Fall of coal	do.
" 22,	Stockton	2	.....	Daniel Maglin	M.	40	2	Explo. of fire-damp	Lived 5 hours.
Novem. 7,	Eckley	2	.....	Ed. Dellely	S.	28	.....	Fall of coal	Instant death.
" 26,	Woodside	1	.....	Wm. Joyce	M.	33	3	do do	Lived 4 days.
Decem. 3,	Jeansville	1	.....	Nimrod Norris	M.	32	4	do do	Lived 30 hours.

LIST *of accidents in South district of Luzerne and Carbon counties for* 1872.

Date.	Names.	Slope	Tunl	Location.	Nature of accidents.
Jan. 24	Conrad Smith	5		Milansville	Burnt by powder.
25	George Ketson	5		Milansville	Injured both legs.
March 12	Conrad Uther			S. Sugar Loaf slope.	Fracture of a leg.
16	Daniel Champbell	4		Eckley	Fracture of a leg.
23	John Bonamers	3		Nesquehoning	Flesh wounds.
	John Barrett	2		Ebervale	Flesh wounds.
30	Jacob Grunawalt	1		Hazleton	Injured but not severely.
April 22	William Manellus	1		Beaver Brook	Burnt face by powder blast.
22	William Elsworth	1		Beaver Brook	Bruised by cars.
23	Hugh Kennedy	5		Treskow	Bruised by a fall of coal.
May 6	James Nicholson			Oakdale slope	Fracture of a leg.
25	William Gallagher		6	Summit Hill	Bruised by cars outside.
31	Thomas Busler	3		Nesquehoning	Fracture of hip and collar bones.
June 8	M. M'Donald	3		Nesquehoning	Burnt by fire-damp.
10	John Daugherty			S. Sugar Loaf slope.	Bumped by cars on the hip.
10	Simon Hartich	1		Stockton	Burnt slightly by fire-damp.
10	Conrad Deisroth	1		Stockton	Burnt slightly by fire-damp.
20	Anthony M'Neal			Oakdale slope	Fracture of leg.
22	Connie Quinn	2		Upper Lehigh	Fracture of leg.
24	Daniel Boyle		6	Summit Hill	Badly bruised by cars outside.
27	Charles Jones		6	Summit Hill	Slightly burnt by fire-damp.
29	Richard Lewis		9	Summit Hill	Hand cut off at the wrist.
29	William Boyle			Cranberry slope, Hazleton	Severely injured by fall of coal.
July 12	D. Maxey	1		Beaver Brook	Fracture of leg.
Aug. 1	Thomas Watkins	1		Drifton	Bruised by fall of coal.
10	Anthony Jordan	2		Ebervale	Bruised on back by coal.
11	George Checkman			S. Sugar Loaf slope.	Fracture of both hips and bruises, by fall of coal.
14	William Walkins	1		Highland	Fracture of leg by fall of coal.
16	James Collins	4		Nesquehoning	Burnt by explosion of fire-damp.
19	Theophilus Horney	1		Upper Lehigh	Lost two fingers.
Sept. 24	Thomas Morgan	5		Hazleton	Cuts by coal falling down slope.
Oct. 26	John Carpenter		1	Jeansville	Severely wounded by fall of slate.
Nov. 2	John Gallagher	2		Upper Lehigh	Fracture of leg by coal.
5	John Brislin			Oakdale slope	Slightly bruised.
6	John Tralon		9	Summit Hill	Wounded severely by premature blast.
6	James Tras		9	Summit Hill	Cuts, not severe, by premature blast.
11	William Worlon	4		Summit Hill	Badly bruised by fall of coal.
Dec. 3	Fred Strobey			Crystal Ridge slope.	Injured severely by coal.

LIST *of collieries, land owners, operators and shipments of coal for* 1873.

No.	Name of Colliery.	Situation.	Land Owners.	Operators.	Shipments of coal.
1...	No. 1 slope...	Upper Lehigh, Luzerne co...	Nescopec coal company.	Upper Lehigh coal company...	205,018.2
2...	No. 2 slope...	Upper Lehigh, Luzerne co...	Nescopec coal company.	Upper Lehigh coal company.	
3...	No. 3 slope...	Upper Lehigh, Luzerne co...	Tench Coxe.	Upper Lehigh coal company...	
4...	No. 1 slope...	Woodside, Luzerne county...	Jeddo coal company...	Jeddo coal company	28,527.10
5 ..	No. 1 slope...	Drifton, Luzerne county	Tench Coxe.	Coxe Bros. & Co...	119,856.18
6...	Jeddo, old slope	Jeddo, Luzerne county..	Union improving company...	G. B. Markle & Co	228,276.18
7...	Red Ash, old slope	Jeddo, Luzerne county...	Union improving company...	G. B. Markle & Co	
8...	Oak Dale, old slope...	Jeddo, Luzerne county..	Union improving company...	G. B. Markle & Co...	
9...	Oak Dale, new slope	Jeddo, Luzerne county...	Union improving company...	G. B. Markle & Co	
10...	No. 1 slope...	Highland, Luzerne county...	Highland coal company	G. B. Markle & Co	72,218.06
11...	No. 2 slope...	Eckley, Luzerne county	Tench Coxe...	Sharp, Weiss & Co...	150,045.09
12...	No. 3 slope...	Eckley, Luzerne county...	Tench Coxe..	Sharp, Weiss & Co	
13...	No. 4 slope...	Eckley, Luzerne county	Tench Coxe.	Sharp, Weiss & Co...	
14...	No. 2 slope...	Buck Mountain, Luzerne co...	Buck Mountain coal compa'y,	Buck Mountain coal company,	125,447.02
15...	No. 4 slope...	Buck Mountain, Luzerne co...	Buck Mountain coal compa'y,	Buck Mountain coal company,	
16...	No. 1 slope...	Ebervale, Luzerne county...	Union improving company...	Ebervale coal company..	207,559.01
17...	No. 2 slope...	Ebervale, Luzerne county...	Union improving company...	Ebervale coal company.	
18 .	No. 3 slope .	Ebervale, Luzerne county	Union improving company...	Ebervale coal company.	
19...	No. 5 slope...	Melonsville, Luzerne county..	Porter's estate	Stout coal company	92,089.04
20...	No. 1 slope...	Harleigh, Luzerne county...	Big Black Creek improv'g co.,	Harleigh coal company..	143,873.08
21...	No. 2 slope...	Harleigh, Luzerne county...	Big Black Creek improv'g co.,	Harleigh coal company..	
22...	No. 3 slope...	Harleigh, Luzerne county....	Big Black Creek improv'g co.,	Harleigh coal company..	
23...	No. 1 slope...	Lattimer, Luzerne county....	Black Creek improving co	Pardee Bros. & Co.	147,996.07
24...	No. 2 slope ..	Lattimer, Luzerne county....	Black Creek improving co....	Pardee Bros. & Co	
25...	No. 1 slope...	Stockton, Luzerne county....	Smith, Roberts & Packer....	Lindiman, Skeer & Co	256,667.17
26...	No. 2 slope...	Stockton, Luzerne county....	Smith, Roberts & Packer....	Lindiman, Skeer & Co...	
27...	No. 4 slope. ...	Stockton, Luzerne county	Smith, Roberts & Packer....	Lindiman, Skeer & Co...	
28..	No. 5 slope...	Stockton, Luzerne county....	Smith, Roberts & Packer....	Lindiman, Skeer & Co...	
29...	No. 3 slope.	Stockton, Luzerne county....	Tench Coxe....	Lindiman, Skeer & Co...	
30...	No. 1 drift . .	Stockton, Luzerne county....	Tench Coxe..	Lindiman, Skeer & Co	
31...	No. 1 slope..	Humboldt, Luzerne county...	L. V. R. R. company	Lindimen, Skeer & Co	63,272.10
32...	No. 1 slope...	Mt. Pleasant, Luzerne county,	C. Koons & Co	Taggert, Butler & Co ..	43,083.17
33...	No. 1 slope...	Beaver Brook, Luzerne co....	French coal company....	Beaver Brook coal company...	80,038.00
34...	No. 2 slope...	Beaver Brook, Luzerne co	French coal company....	Beaver Brook coal company...	
35..	No. 3 slope...	Beaver Brook, Luzerne co	French coal company....	Beaver Brook coal company...	
36...	Sugar Loaf, No. 1 slope...	Hazleton, Luzerne county....	Diamond coal company.	A. Pardee & Co...	457,796.06
37...	Sugar Loaf, No. 2 slope...	Hazleton, Luzerne county....	Diamond coal company.	A. Pardee & Co...	

LIST *of collieries, land owners, operators and shipments of coal for* 1872—*Continued.*

No.	Name of Colliery.	Situation.	Land Owners.	Operators.	Shipments of coal.
38...	Sugar Loaf, No. 3 slope.....	Hazleton, Luzerne county.....	Diamond coal company.....	A. Pardee & Co.....	.....
39...	Old slope.....	Hazleton, Luzerne county.....	L. V. R. R. company.....	A. Pardee & Co.....	.....
40...	Laurel Hill, No. 3 slope	Hazleton, Luzerne county.....	L. V. R. R. company.....	A. Pardee & Co.....	.....
41...	Laurel Hill, No. 4 slope	Hazleton, Luzerne county.....	L. V. R. R. company.....	A. Pardee & Co.....	.....
42...	Laurel Hill, No. 5 slope	Hazleton, Luzerne county.....	L. V. R. R. company.....	A. Pardee & Co.....	.....
43...	Cranberry slope	Hazleton, Luzerne county.....	E. Roberts & Bros	A. Pardee & Co.....	.....
44...	Crystal Ridge, No. 1 slope...	Hazleton, Luzerne county	E. Roberts & Bros	A. Pardee & Co.....	.....
45...	Crystal Ridge, No. 2 slope...	Hazleton, Luzerne county.....	E. Roberts & Bros	A. Pardee & Co.....	.....
46...	No. 1 drift.....	Gowen, Luzerne county.....	Roberts coal company.....	Roberts Run coal company.....	Not reported
47...	No. 2 drift.....	Gowen, Luzerne county.....	Roberts coal company.....	Roberts Run coal company.....	.....
48...	No. 1 slope.....	Gowen, Luzerne county.....	Roberts coal company.....	Roberts Run coal company.....	.....
49...	No. 1 slope.....	Yorktown, Carbon county.....	N. Y. and Lehigh coal co.....	A. L. Mumper & Co	156,000.00
50...	No. 2 slope.....	Yorktown, Carbon county.....	N. Y. and Lehigh coal co.....	A. L. Mumper & Co	.....
51...	No. 4 slope.....	Yorktown, Carbon county	N. Y. and Lehigh coal co.....	A. L. Mumper & Co	.....
52	No. 5 slope.....	Yorktown, Carbon county	N. Y. and Lehigh coal co.....	A. L. Mumper & Co	.....
53...	No. 1 slope.....	Jeansville, Carbon and Luzerne counties....	Spring Mountain coal co	Spring Mountain coal co.....	150,000.00
54...	No. 3 slope.....		Spring Mountain coal co	Spring Mountain coal co.....	.....
55...	No. 4 slope.....	Jeansville, Carbon and Luzerne counties..	Spring Mountain coal co	Spring Mountain coal co	.....
56...	No. 5 slope.....		Spring Mountain coal co	Spring Mountain coal co.....	.....
57...	No. 1 drift.....		Spring Mountain coal co.....	Spring Mountain coal co.....	.....
58...	No. 1 drift.....	Coleraine, Carbon county.....	W. T. Carter & Co	W. T. Carter & Co	150,000.00
59...	No. 2 drift	Coleraine, Carbon county.	W. T. Carter & Co	W. T. Carter & Co	.....
60...	No. 3 drift	Coleraine, Carbon county.....	W. T. Carter & Co	W. T. Carter & Co.....	.....
61...	No. 1 slope.....	Coleraine, Carbon county.	W. T. Carter & &o	W. T. Carter & Co	.....
62...	No. 2 slope	Coleraine, Carbon county.	W. T. Carter & Co	W. T. Carter & Co.	.....
63...	No. 1 slope.....	Beaver Meadow, Carbon co.....	Tench Coxe.	Ely Martin & Co	10,000.00
64...	No. 2 slope.....	Beaver Meadow, Carbon co.....	Tench Coxe.	Ely Martin & Co.....	.....
65...	No. 2 slope.....	Treskow, Carbon county.	S. Bounel, Jr.....	S. Bounel, Jr	94,458.00
66...	No. 4 slope.....	Treskow, Carbon county.....	S. Bounel, Jr.....	S. Bounel, Jr.....	.....
67...	No. 5 slope.....	Treskow, Carbon county	S. Bounel, Jr	S. Bounel, Jr.....	.....
68...	No. 6 slope.....	Treskow. Carbon county	S. Bounel, Jr	S. Bounel, Jr.....	.....
69...	No. 4 slope.....	Summit Hill, Carbon county...	L. C. and N. company.....	L. C. and N. company	84,477.14
70...	No. 5 tunnel.....	Summit Hill, Carbon county...	L. C. and N. company.....	L. C. and N. company.....	77,053.00
71...	No. 6 tunnel	Summit Hill, Carbon county...	L. C. and N. company.....	L. C. and N. company	69,377.00
72...	Mt. Tunnel.....	Summit Hill, Carbon county...	L. C. and N. company.....	L. C. and N. company.....	.....
73...	No. 9 tunnel.....	Summit Hill, Carbon county...	L. C. and N. company.....	Thomas Phillips	68,936.00
74...	No. 1 shaft.....	Nesquehoning, Carbon county	L. C. and N. company.....	L. C. and N. company.....	68,597.00

75...	No. 3 slope.....	Nesquehoning, Carbon county	L. C. and N. company.....	L. C. and N. company.....	.....
76...	No. 4 slope.....	Nesquehoning, Carbon county	L. C. and N. company.....	L. C. and N. company.....	.....
77...	No. 2 tunnel.....	Nesquehoning, Carbon county	L. C. and N. company.....	L. C. and N. company.....	.....
				Total.....	3,056,523.06

Total of coal shipped as reported, 3,056,523.06; coal that has been shipped and not reported, with that used to generate steam at mines, railroads, workshops and for domestic purposes, would swell this amount to 3,500,000.00.

LIST OF FATAL ACCIDENTS IN THE SOUTH DISTRICT OF LUZERNE AND CARBON COUNTIES FOR THE YEAR 1872.

No. 1. George Wills, married, aged 35 years, was killed on the 5th of January, 1872, by a fall of coal in breast in No. 3 slope, Stockton. Mr. Wills leaves a wife and three children to mourn his loss, in England.

No. 2. John Wigand, single, aged 21 years, was killed at foot of breaker plane at upper Lehigh, January 18. The deceased and another young man were standing at foot of breaker plane at the time the car was being hoisted, when it was about landing the swivel bolt broke, which left the car run back. They could have gotten away safely had they listened to the man on top of breaker, for he detected the bolt before it broke and called on them to get out of the way, but the deceased, through excitement, could not get away and was struck by the car, which killed him instantly. The other young man escaped without the least injury.

No. 3. James Malley, single, aged 20 years, was burned by the explosion of a keg of powder, on 18th of January, and died on the 21st of the same month, at No. 2 slope, Buck Mountain.

No. 4. James G. Marshall, aged 18 years. Instant death by being bumped between cars on gangway, while driving, at Woodside slope, Feb. 9.

No. 5. A. Gaitenhiger, married, aged 52 years, came to his death on the 10th of February by being run over by a car in Hazleton (old) slope.

Nos. 6 and 7. Andrew O'Donneld, married, aged 50 years, and James Sweeney, married, aged 35 years, came to their death by a fall of coal in breast, at No. 1 slope, Yorktown, on the 27th of March. Mr. O'Donneld leaves a wife and seven children, and Mr. Sweeney a wife and two children, to mourn their loss. Inquest held by Dr. E. B. Longshor, J. P. Decision of jury: The deceased persons came to their death through neglect of propping.

No. 8. William Morrist, aged 50 years, married, was instantly killed by a fall of coal in breast at No. 2 slope, Stockton, on the 10th of April. He leaves a wife and one child to mourn his loss.

No. 9. James Boyle, aged 18 years, was instantly killed by a fall of coal in breast, in Cranberry slope, on the 11th of April.

No. 10. John Gallagher, aged 22 years, single, was instantly killed, by the face of his breast running suddenly upon him. He was covered with several tons of coal and slate, and was there for nearly forty hours before he was found, at No. 4 slope, Buck mountain, on the 12th of June.

No. 11. Francis Ward, aged 22 years, single, was instantly killed by a fall of coal in breast, at No. 4 slope, Eckley, on the 18th of June. Accidental death.

No. 12. Reuben Canera, aged 20 years, was injured on the 24th of June, and died on the 25th of same month. He was bumped between a car and rib of coal in No. 4 slope, Summit Hill. Accidental death.

No. 13. Archibald Williams, aged 19 years, was injured on the 11th of July, by a lump of coal running against him from battery of breast, fracturing his leg so badly that he died on the 25th of same month, at No. 5 slope, Treskow.

No. 14. Edward Parker, married, met his death by a fall of slate in Wharton vein, No. 1 slope, Yorktown, on August 1st. He leaves a wife and three children to mourn his loss.

No. 15. John Ward, single, aged 32 years, was instantly killed by a fall of coal on gangway, while opening a new breast, in Laurel Hill, old slope, on the 3d of August.

No. 16. Thomas D. Williams, aged 70 years, was instantly killed by being struck by a piece of coal from a premature blast in breast, in No. 5 Tunnel, Summit Hill, August 8th.

No. 17. Jenkin Prosser, aged 27 years, met with a severe accident in No. 2 slope, Latimore, August 19th, by a premature blast in breast, from which he died on the 23d of same month. Mr. Prosser leaves a wife and two children to mourn his loss.

No. 18. Frederick Hinder, aged 23 years, single, was instantly killed while cutting room for a prop in schute. The gangway prop either broke or got loose from bottom slate, gauff and timber fell on him, which caused instant death, October 14th, at No. 2 slope, Eckley.

No. 19. Thos. Boyle, aged 18 years, driver, fell under cars in No. 1 drift, Colerain. This boy was driving from the turn-out to mouth of drift. The inside drivers missing him went in search of him, and found him lying dead alongside of his trip of cars. By examination we have every reason to believe that he jumped

off the cars after his hat and lamp, which fell off, without stopping the mules. His foot slipped on a piece of slate, and he fell under cars and was dragged about 17 feet. Dr. E. B. Lorzstor, J. P., held inquest. Decision of jury: Accidental death, October 18.

No. 20. Charles Depuey, aged 13 years, was instantly killed by falling into the small rollers in Laurel Hill breaker, Hazleton, October 22. This young boy was doing something to his seat on the schute. In the act of doing it his foot slipped and he fell into the schute leading to the rollers, feet foremost, passing under a platform that covered the rollers, that extended up the schute 18 inches and 6½ inches high. The rollers caught the foot and drawed the whole body through, completely smashing it up, and no help could be rendered in any way.

No. 21. Charles Paul, aged 45 years, widower, 6 children, met instant death by a fall of coal in face of breast in No. 2 slope, Colerain, on October 22. He had put a blast in the coal, which did not bring it down. He took a pick and commenced working under it to loose it. While in the act of doing so the coal fell on him, causing instant death.

No. 22. Daniel Maglin, aged 40 years, married, 2 children, met his death in No. 2 slope, Stockton, October 22, by an explosion of fire-damp at the battery of his breast. This was an unexpected occurrence, as no gas had been found there before. His breast had fell very heavy a few days before the accident and closed it up entirely. The vein doubled at this point. He and his partner were filling cars to rid it. The deceased, perceiving a hole through the coal, put his lamp up into it to see into the breast. This ignited the gas that had accumulated unawares to him on the top of the loose coal. He was burned and bruised so bad that he lived but a few hours.

No. 23. Edward Delliley, aged 28 years, single, met instant death by a fall of coal in breast in No. 2 slope, Eckley, November 7, two slips meeting each other in top coal, causing it to fall off, quite unawares to him or his partner. This place was considered quite safe before the accident.

No. 24. Wm. Joyce, aged 33 years, wife and 3 children in England, was injured by a fall of coal in a breast in No. 1 slope, Woodside, November 26. He had a leg fractured and also injured in the side of his bowels, causing inflammation, from which he died on the 30th of the same month.

No. 25. Nimrod Norris, aged 32, married, 4 children, was injured by a fall of coal in the Wharton vein gangway, in No. 1 slope, Jeanesville, on the 3d of December, and died on the evening of the next day, living about 30 hours after the accident.

REPORT GIVING DESCRIPTION AND CONDITION OF COLLIERIES IN SOUTH DISTRICT OF LUZERNE AND CARBON COUNTIES.

COLLIERY No. 1--UPPER LEHIGH. *Luzerne county.—Land owners, The Nescopec Coal Co.—Operators, Upper Lehigh Coal Co.*

Slopes No. 1 and No. 2 are on the north side of basin and on the estate of Nescopec coal company.

No. 3 is on the south side of basin and on the estate of Hon. Tench Cox. The vein worked is the Buck Mountain. Average thickness 14 feet of good clear coal, a strong bottom slate and an excellent roof. These works and machinery are in excellent order. Great attention is paid to the ventilation of the mines by the mine agent, Wm. Powell, sr., and W. Powell, jr., assistant.

No. 1 slope, south dip, 320 feet in length and 150 feet vertical, with a pumping slope of the same length, and an inside slope in west gangway, called No. 5 slope, with an hoisting engine and steam pump. The steam is carried through pipes from the surface boilers, and the exhaust is put into the upcast to assist the furnace to create ventilation for the use of mines. The current of air traveling through the workings at present will average 16,000 cubic feet per minute. The slopes and workings are in good condition.

No. 2 slope, south dip, 330 feet in length, 191 feet vertical; also a pumping slope of the same length. A large and commodious breaker is built at the top of this slope, and the cars are taken out of No. 2 slope to top of breaker; also cars of No. 1 slope are taken up a breaker up lane on the opposite side from No. 2.

This breaker prepares the coal of both slopes. There is also an outside slope in the east gangway of No. 2 slope, called No. 4 slope. There are extensive workings and well ventilated by a twelve feet fan on the east side and a furnace on west side. The current of air on both sides will average 30,000 cubic feet per minute.

The directions of gangway in starting from all the slopes are east and west, but the west gangway is gone around the basin and is now nearly opposite the slope on the opposite pitch of No. 2 slope. These workings formerly constituted the Upper Lehigh collieries, and coal is shipped at present only from these. The shipment for 1872 is 205,018.1 tons. In blasting the coal 3,277 kegs of powder were used. Men and boys employed inside, 139; men and boys employed outside, 93; total in two slopes, 232. Mules inside, 34; outside, 15; total in two slopes, 49.

No. 3 slope, north dip. This is a new slope now sinking on the opposite side of the upper Lehigh Basin, on the estate of Hon. Tench Coxe, employing at present, 18 men and boys; 97 kegs of powder have been used. The machinery of all the collieries consist of 8 hoisting engines, 6 pumping engines, 1 breaker engine, 1 fan engine—total 16 stationary engines of 426-horse power. Two steam pumps and 24 boilers, all of which are in good condition.

D. Bertsch, superintendent; Wm. Powell, Sr., mine agent; W. Powell, Jr., assistant; S. M. Rigliter, outside foreman.

COLLIERY NO. 2, CROSS CREEK, *Drifton, Luzerne county.—on the estate of Hon. Tench Coxe—Operators, Coxe, Bros. & Co.*

No. 1 slope is 360 feet in length, 108 feet vertical. This slope is sunk on the Buck Mountain vein; average thickness 14 feet. Also a slant is driven half course to the pitch of the slope from the top, to take empty cars down to counter gangways which are about 900 feet in length, on west side of slope. Direction of gangways east and west from slope, which is pitching north. This is a fine colliery, well conducted and well ventilated by 2 furnaces, assisted on west side by exhaust steam from steam pump. The present amount of air traveling on both sides is 24,000 cubic feet per minute. This vein has a good strong slate bottom and an excellent roof of rock, a moderate pitch, good clean coal and a large breaker to prepare the coal, worked by a 30-horse power engine. The machinery consists of 2 hoisting engines of 152-horse power, 2 pumping engines of 200-horse power= 382 horse power. Ten boilers in good order; coal shipped 119,407 4-20 tons; powder used 2,400 kegs; men and boys employed inside 129, outside 83=212; mules inside 28, outside 4=32. Arthur M'Clellan, superintendent; Ed. L. Powell, mine agent.

COLLIERY, No. 3, WOODSIDE, *Luzerne county.—Land owners, Jeddo Coal Co.—Operators, Jeddo Coal Company.*

No. 1 slope, south dip, is 270 feet in length, and 136 feet vertical. This slope also works the Buck Mountain vein, the average thickness of which is 14 feet.—Direction of gangways is east and west from the slope. This is not a very extensive colliery, yet it is well conducted and well ventilated. The air passing through the mines amounts to 15,000 cubic feet per minute. The machinery and boilers are in good order, and consists of a breaker, worked by a 25-horse power engine, 2 hoisting engines of 60-horse power, and 1 pumping engine of 60-horse power= to 145-horse power; boilers 6. Coal shipped in 1872, is 28,627 tons.

H. L. Fuller, superintendent; William M'Donel, mine agent.

COLLIERY, No. 4, JEDDO, *Luzerne county.—Land owners, Union Improving Co.—Operators, G. B. Markle & Co.*

Old slope is 350 feet in length, 181 feet vertical. This slope is sunk in and works the big vein; average thickness 27 feet; it is well ventilated, but nearly worked out. Machinery consists of 1 hoisting engine of 80-horse power, 1 breaker,

worked by a 25-horse power engine, 1 pumping engine of 80-horse power. Total horse power of engines 185; boilers 12. Men and boys employed inside 69, outside 63=132; mules 18; coal shipped in 1872, 70,050 tons; powder used, 712 kegs. Wm. H. Thomas, mine agent; Stephen Thraslur, outside foreman.

Red Ash slope.—Length 846 feet, vertical 434 feet. Buck Mountain vein in thickness 14 feet, well ventilated, but nearly worked out. Average air traveling 18,000 cubic feet per minute.

Machinery consists of 1 hoisting engine of 50-horse power; 1 breaker worked by a 25-horse power engine; pumping engine, 40-horse power; 1 steam pump, 50-horse power; total horse power of engines, 146; coal shipped in 1872, 39,725 tons; powder used, 817 kegs; men and boys employed inside, 52; men and boys employed outside, 39; total, 91; mules, 14. George Patterson, mine agent; C. Andrews, outside foreman.

Oakdale slope, No. 1. Length, 640 feet; 313 feet vertical. This slope is sunk in and works the Big vein. Average thickness, 27 feet. Two gangways, one east and one west. The east gangway is a very long one, going around a point of the basin. A locomotive engine is used in this gangway to bring back the coal from a turn-out where it is brought from the miners by mules. The air is let down through a down-cast passing the miners or face of the workings, going up east, to near the bottom of the slope, through the gangway in which the locomotive works. There is also a letting down plane from a counter in the west gangway. The mines are well ventilated. The present current of air traveling on both sides is about 20,000 cubic feet per minute. The machinery consists of 1 hoisting engine of 80-horse power; 1 breaker engine of 30-horse power; steam pump, 50-horse power; 1 locomotive, 15-horse power; total horse power of engines, 160; boilers, 12; Wm. Bradley, mine agent; Robert Cawany, outside foreman; men and boys employed inside, 88; men and boys employed outside, 61; total, 149; mules, 20; coal shipped in 1872, 119,042 tons; powder used, 1,350 kegs.

Oakdale slope, No. 2, south dip. This slope is quite new, and is sunk a lift below the No. 1 slope. Breaker not ready. Machinery—one hoisting engine of 80 horse power: a steam pump and 4 large boilers. Ventilation good. Two gangways are driven to open work. Coal goes to Oakdale, No. 1. Wm. H. Thomas, mine agent.

COLLIERY NO. 5, HIGHLAND MINES.—*Land owners, Highland Coal Company. Operators, G. B. Markle & Co.*

Slope No. 1, south dip. Length, 661 feet; 319 feet vertical. This slope is sunk in the Buck Mountain vein. Average thickness, 14 feet. Gangways are driven east and west. The present workings are nearly worked out. The company is preparing to sink a lift lower. This will make the third lift in this slope. These mines are well conducted. Ventilation good. Average air traveling the workings is 22,464 cubic feet per minute. Ventilated by exhaust steam from steam pump. Men and boys employed inside, 74; outside, 62; total, 136; mules, 23; machinery, 1 hoisting engine of 80-horse power; breaker engine of 30 horse power; 2 steam pumps, 50 horse power each; total horse power of engines, 210; boilers, 9; coal shipped in 1872, 83,511 tons: powder used, 989 kegs. Peter Brown, mine boss. All these works are operated by the same company, viz: G. B. Markle & Co. They have four breakers at work and one nearly ready, viz: Jeddo Red Ash, Oakdale, No. 1, Highland, the new one at Oakdale, No. 2. G. B. Markle, superintendent; John Turner, mine agent.

COUNCIL RIDGE COLLIERIES, *Eckley, Luzerne county.—Land owner, Hon. Tench Coxe.—Sharp, Weiss & Co., Operators.*

This colliery has 3 hoisting slopes, 2 pumping slopes and 2 slopes inside; 2 large breakers; 6 hoisting engines and steam pumps to drain these works, with 26 boilers. These works are all on the Buck Mountain vein. Average thickness about 13 feet.

Slope No. 2, north dip. Length, 630 feet; vertical, 300 feet. Well ventilated by exhaust from steam pump. Air according to measurement for the month of

November, 16,456 cubic feet per minute on both sides, east and west. An inside slope in the west gangway of this slope, with hoisting engine with 2 boilers.

Slope No. 3, south dip. Length, 750 feet; 200 feet vertical. This slope is not so well ventilated as the others. The air at present is 4,764 cubic feet per minute for 27 men and boys and 7 mules. The work of this slope is all in an inside slope, with an engine and boiler. The inside slopes are driven to reach deep places in these small basins.

No. 4 slope, north dip, is in length 300 feet, 160 feet vertical. This work is well ventilated on both sides, by a furnace on north-west and exhaust from steam pump on south-west side. The east gangway is driven around the point of basin and has gone around from east to west on the north side of the basin, in which the company is preparing a place to sink an inside slope, to work the coal lying under the south-west and north-west gangways. Average amount of air traveling through this work is 17,312 cubic feet per minute.

All the machinery and boilers of these collieries are reported to be in good condition. Men and boys employed inside 180, outside 141 = 321; coal shippe in 1872, 150,045 tons and 9 cwt.

Sharp and Weiss, superintendents; Samuel Bateman, mine agent.

BUCK MOUNTAIN COLLIER, *Luzerne and Carbon counties.—Land owners and Operators, Buck Mountain Coal Company.*

The mines are in Luzerne county, and the breaker in Carbon county. The coal worked is the Buck Mountain vein. The seam, altogether, will make 15 feet of coal, but there is a slate from 2 to 4 feet thick, dividing the vein into two seams. This runs about 6 feet in the vein above bottom slate. The coal below it is called six feet, and that which is above 9 feet or top bench; This bench is an excellent coal, clean and good in quality. The 6 feet is a rougher, but a good, strong coal. No. 1 and No. 3 slopes are abandoned for the present. No. 2 and No. 4 slopes are working.

No. 2 slope, south dip. Length 270 feet; 160 feet vertical. Direction of gangways, east and west. The work at present on the east side is in an inside slope: the west side has several gangways and counter gangways, also letting down planes, (balance plane,) from a counter to main gangway. The work is nearly all on the top or 9 feet bench. There is also in this side, a slope into one of these troughs that is so common in the Buck Mountain vein, but not at work at present.

William Hendson, mine boss.

Slope No. 4, north dip. Length 726 feet, 125 feet vertical. The slope is situated about two miles south from breaker. The workings of this slope are nearly the same as those of No. 2, and working the same vein. Direction of gangways, east and west. Ventilation good, and nearly all the work is on the top bench. The roof is generally good. The coal is taken down a balance plane to slope No. 3, and then drawn to the top of a hill situated between slopes No. 3 and No. 2, by an engine. The cars have a grade to run from here for a considerable distance to the top of a balance plane that lets them down to No. 2 slope. Then the coal from No. 2 and No. 4 slopes is let down a balance plane to the breaker, which makes it a difficult place to work in the winter season.

Mining boss, George Hendson.

Men and boys employed inside in both slopes, 176; men and boys employed outside in both slopes, 79; total, 255. Mules, 63. Coal shipped in 1872, 125,585 tons. Powder used 3,442 kegs; machinery, three hoisting engines 220-horse power; one breaker engine of 30-horse power; pumping engine 60-horse power; one saw mill engine of 20-horse power; total horse power of engines, 330. Two large steam pumps and 32 boilers reported in good condition.

General superintendent, Wm. Spencer; outside foreman, Geo. Hughes.

EBERVALE COLLIERY, *Luzerne county.—Landowners, Union Improvement Company.—Operators, Ebervale Coal Company.*

Slope No. 1, south dip. Length, —— feet; —— feet vertical. Slope No. 2, south dip. length —— feet; —— feet vertical. These slopes are sunk convenient to each

other and into the same workings and are working the Big coal vein only. Direction of gangways east and west. Thickness of vein, 27 feet. A new lift has lately been sunk in these slopes to bottom of basin and will work both pitches. The breaker of these slopes was formerly at the top of No. 1 slope. On the 30th of August, 1872, this large and commodious breaker was distroyed by fire. The erection of another to take its place was soon commenced at the top of No. 2 slope, and will soon be ready for operation. Nearly all the men are employed in No. 3 slope, as the company is working this slope day and night for the purpose of keeping the men employed.

No. 3 slope, north dip. Length 742 feet, 247 feet vertical. This slope is also sunk in the Big vein, and is connected by an air-way with Nos. 1 and 2 slopes, and has also a good traveling way. These colleries are in good condition, and are well ventilated. The average amount of air traveling each of the workings of these slopes, is about 9,000 cubic feet per minute.

The machinery consists of 3 hoisting engines of 180-horse power, 2 breaker engines of 50-horse power, 5 pumping engines of 320-horse power=10 engines of 550 horse power; boilers 38.

Coal shipped in 1872, was 207,559 tons. Men and boys employed inside 200, outside 160=350.

MILNESVILLE COLLIERY, *Luzerne county.—Land owner, Perter's estate.—Operators, Stout Coal Company.*

No. 5 slope, north dip. Length 280 feet, and 120 feet vertical. The coal worked is the Big vein; thickness 27 feet. This basin is very shallow; the slope is sunk to bottom of basin, and works both pitches; the coal is good and strong, but that on east and west side is faulty. This work is well ventilated by exhaust steam from pump; 12,000 cubic feet per minute of air pass through the workings; all the other slopes are abandoned.

The machinery consists of 2 hoisting engines of 84-horse power, 1 breaker engine of 25-horse power, 1 pumping engine of 25-horse power, 2 steam pumps and 13 boilers, all of which are reported in good condition. Men and boys employed inside 60, outside 58=118; mules 10. Coal shipped in 1872 was 92,089 tons; powder used, 1,375 kegs.

W. H. Harris, of Ebervale, snperintendent; Charles Kerbaugh, assistant; Jno. Cleghour, outside foreman; Paul Winters, mine boss.

HARLEIGH COLLIERIES, *Luzerne county.—Land owners, Big Black Creek Improvement Co.—Operators, Harleigh Coal Company.*

No. 1 slope, south dip. Length, 461 feet; vertical, 155 feet. The coal worked is the Big vein; thickness 27 feet. Ventilation is much the same as that of last year, so that the mines are now tolerably well ventilated. Amount of air passing at present is 5,700 cubic feet per minute. There is also at No. 1 slope, an inside slope of about 80 yards in length, hoisting the coal to the bottom of No. 1. The hoisting engine and steam pump are supplied with steam from the surface.

No. 2 slope. This is a pumping slope to drain the surface water of No. 1.

No. 3 slope, south dip. Length, 609 feet; vertical 297 feet. This slope is also sunk and worked in the big vein; average thickness 27 feet. This slope works the coal below No. 1, or is a lift deeper in the basin. In No. 3 there is also an inside slope to the bottom of basin, about 100 yards in length. Two gangways are driven in a circular form to follow the basin, both started on the west side. The basin here forms a kind of circle.

The machinery consists of 4 hoisting engines of 155-horse power, 2 breaker engines of 60-horse power, 1 pumping engine of 80-horse power and 16 steam pumps of 180-horse power=13 engines of 1,710-horse power. Coal shipped 144,764 tons;

powder used 2,534 kegs; men and boys employed inside 206, outside 105=311: mules 26. Morgan Silliman, superintendent; Daniel Reid, mine boss; Wm. Silver and Perry Fitzsimon, outside foreman.

LATTIMER COLLIERIES, *Luzerne Co.—Land owners, Black Creek Improving Co.—Operators, Pardee Bros. & Co.*

No. 1 slope, north dip. Length, 489 feet; vertical, 297 feet.

No. 2 slope, south dip. Length, 360 feet; vertical, 297 feet. The coal worked is the Big vein; average thickness, 27 feet. Both slopes are down to the basin and connected with each other by a gangway driven across the basin, yet the workings are separate, but much better ventilated. The air at present is tolerable in No. 1 and good in No. 2. The amount of air passing through the workings of both slopes is 11,620 cubic feet per minute. There are 2 breakers with an engine to each—one on each slope; 2 hoisting engines; several large steam pumps; 22 boilers in good order. Men and boys employed inside, 169; men and boys employed outside, 108; total, 277. Mules, 32. Coal shipped in 1872, 148,390 tons; powder used, 2,771 kegs.

M. M. Cooper, superintendent; Wm. Martin, mine boss.

STOCKTON COLLIERIES. *Luzerne Co.—Land owners, Smith, Roberts and Parker—No. 3 slope is on Tench Coxe's land.—Operators, Linderman, Skeer & Co.*

The coal worked is the Mammoth or big vein; average thickness, 27 feet.

No. 1 slope, north dip. Length, 840 feet. This slope was destroyed by a crashing in of the slope the beginning of August, 1872, caused by working too near to the slope in the two upper lifts, the pillars being too weak to support it; so the pump slope as well as the hoisting slope was destroyed. The lower lift or the present workings are connected with those of No. 2 slope, and are nearly at a level also with the workings of No. 5 slope, but a lift below them. The water is pumped up at present to No. 5 and from there to No. 4 slope

Men and boys employed inside, 60, and 43 outside, making a total of 103, most of which are working in the other slopes. Amount of coal shipped from this slope in 1872 was 35,073 tons.

Machinery.—1 hoisting engine, 1 pumping engine, and 1 breaker engine; total of horse power, 170; 2 steam pumps.

Edward Murdue, mine boss; John Travarn, outside foreman.

No. 2 slope, south dip. Length, 1,200 feet. This slope is working the Big vein; average thickness, 27 feet. The workings at present are on the east side of the slope, those on the west side have been abandoned for some time. The workings are connected with those of Nos. 1 and 3 slopes; also a good traveling way. The ventilation was rather weak for some time, owing to the water being so high in the workings of No. 1 slope, which was the intake for this slope before the crush in No. 1 slope, so they had to make their traveling way an intake for some time; now the water is pumped low enough to admit the passage of air. The ventilation is much improved at present. The amount of air traveling through the workings will measure 7,000 cubic feet per minute. Men and boys employed inside, 66; outside, 42; making a total of 108; mules, 12 inside and 2 outside, making a total of 14; amount of coal shipped in 1872, 47,382 tons; powder used, 450 kegs; machinery, 1 hoisting engine of 100-horse power; 1 breaker engine of 30-horse power; pumping engine of 60-horse power, and a steam pump. John James, mine boss; David Holman, outside foreman.

No. 3 slope, north dip. Length, 885 feet; Tench Coxe, land owner; Tenoerman, Skeer & Co., operators. The coal worked is the Big vein; average thickness 27 feet. This work will soon be abandoned if not sunk deeper, as they are working the pillars out. The lease expires at the close of the year 1872. I believe the company will renew the lease and open the work anew, by sinking the slope deeper. Ventilation good; ventilated by means of a furnace. Men and boys employed inside, 72; outside, 41; making a total of 113; mules, inside 12, outside 3; total 15; amount of coal shipped in 1872, 77,600 tons; powder used in

blasting, 891 kegs; machinery, 1 hoisting engine of 60-horse power; 1 breaker engine of 30-horse power; pumping engine of 60-horse power; total horse power of engines 150. Samuel Simmons, mine boss; John Steven, outside foreman.

No. 4 slope, north dip. A pumping slope; and also hoisting men out of the mines of No. 5. Machinery, 1 hoisting engine; 1 pumping engine and steam pump.

No. 5 slope, north dip, length 621 feet. The coal worked is the Big vein; average thickness, 27 feet. The workings in this slope are well ventilated and on the east side works two ranges. The coal of the upper range is let down to the lower ganway by a balance plane. This slope and No. 4 are on the property of Smith, Roberts & Packer. Men and boys employed inside 94, outside 56, making a total of 150; amount of coal shipped in 1872, 94,304 tons; powder used 1,707 kegs.

Mine boss, John Airey; outside foreman, Henry Rough.

Amount of coal shipped by the company in 1872, 256,667.17 tons.

General superintendent, Wm. Carr. Mine agent, John Beecroft.

HUMBOLT COLLIERY, *Luzerne county.—Land owners, L. V. R. R. Co.—Operators, Linderman, Skeer & Co.*

No. 1 slope, north dip, length 390 feet, vertical 150 feet. The coal is the Wharton vein; average thickness, 9 feet; direction of gangways, east and west. This slope is driven to the basin. The basin dips west from the slope, so that they have two gangways on west side, one on each pitch. This work is tolerably ventilated. The work at present is all on the east side, as the range has got too short on the west side. A new inside slope will be sunk on the west side to the basin for the purpose of lifting the range. The air passing through the workings at present is 8,000 cubic feet per minute. Men and boys employed inside 75, outside 43, making a total of 118. Mules inside 9, outside 7, total 16. Amount of coal shipped in 1872, 63,272½ tons.

Mine agent, Wm. Airey.

MT. PLEASANT COLLIERY, *Luzerne county.—Land owners, C. Koons & Co.—Operators, Taggert, Butler & Co.*

No. 1 slope, north dip. Length, 420 feet. Thickness of vein is 9 feet, being the Wharton. This work at present is well ventilated by two furnaces, one on each side. The air passing through the workings of the mines in the month of November, 1872, was 16,500 cubic feet per minute. The gangways at the bottom are driven east and north-east. About midway in the slope there is a counter-gangway. It starts west and comes around over the north-east gangway, following the circumference of the basin. There are 2 breakers on the property, only 1 of them working; 2 hosting engines, 1 at the slope and 1 at the breaker; a pumping engine and a steam pump; men and boys employed inside, 86: outside, 45; making a total of 131; coal shipped in 1872, 43,083 tons 17 cwt. Wm. Taggert, superintendent; Ralph B. Platt, mine boss.

BEAVER BROOK COLLIERIES, FRENCHTOWN, *Luzerne county.—Land owners, Frenchtown Coal Company.—Operators, Beaver Brook Coal Company.*

There are two slopes and two breakers in operation. One sinking at present.

No. 1 slope, south dip. Length, 420 feet; vertical, 160 feet. The coal worked is the Big vein. Average thickness, 25 feet of beautiful coal. Direction of gangways, east and west. East gangway is driven to the line. West gangway, after having been driven for a considerable distance in the basin, took to rise west, which shortens the range very much and caused the company considerable trouble and expense. The basin is now dipping west. This work is well ventilated. Amount of air passing through the workings is 11,425 cubic feet per minute.

No. 2 slope, south dip. Not in same basin as No. 1 but in the basin south of it. The coal worked is the Wharton. Average thickness, 8 feet; length, 759 feet: vertical, 130 feet. It has been driven down to the south line of Frenchtown property. Average pitch of the vein is 13 degrees, so they commenced working from the bottom upward. Gangways are driven east and west from the slope, and the breasts are worked one-half course and the cars are taken into them. Counter gangways driven off the slope at certain distances are driven across the top of the breasts. This slope is working with a single tract for the purpose of hitching or coupling to cars on any part of the slope. The air is good. The amount of air in these works is about 10,000 cubic feet per minute, partly caused by the exhaust from a steam pump and by air going through an air-way to No. 1, Yorktown.

No. 3 slope. This is a new slope now sinking in the Wharton vein in the same basin as No. 1 slope. Men and boys employed inside, 176; men and boys employed outside, 111; total, 287; mules, 19; amount of coal shipped, 80,038 tons; powder used, 1,650 kegs. E. Bullock, superintendent; D. Reese, mine agent. Machinery, 2 hoisting engines of 140-horse power; 2 breaker engines of 60-horse power; 2 pumping engines of 110-horse power; total horse power, 310.

HAZLETON COLLIERIES, *Luzerne county.—Land owners, Diamond Coal Company. Operators, A. Pardee & Co.*

Old Sugar Loaf slope, south dip.—Length 1,755 feet, and vertical 979 feet.

New Sugar Loaf, or No. 2 slope, south dip.—Length 1, 165 feet, and vertical 539 feet. These slopes are sunk in the Big vein, and the old one sunk to the basin. The slopes are about 150 yards apart, and a breaker erected between them. The bottom lift was worked through the old slope, and the lift above through the new slope. The bottom lift, or that which was good to work, is at present full of water. The present workings is only that of taking pillars out, and driving a rock tunnel to the opposite pitch from the bottom of the new or No. 2 slope. Air is rather weak in these workings, and but few men are employed.

The machinery consists of 2 hoisting engines, one 40 and the other 80-horse power, 1 breaker engine of 40-horse power, 2 pumping engines, one 60 and the other 70-horse power; boilers 23.

South Sugar Loaf, or No. 3 slope.—Length 666 feet; vertical 382 feet, north dip. A fine new work, and tolerably ventilated by steam exhaust from steam pump. Coal worked is the Big vein; average thickness 27 feet. There is also a fine breaker erected at the top of this slope for preparing the coal.

The machinery consists of 1 hoisting engine of 90-horse power, 1 breaker engine of 20-horse power and 2 steam pumps; boilers 8.

Wm. Fotkin, mine boss.

No. 1, Old Slope, south dip.—Length 2,271 feet; vertical 836 feet.—Land owners, L. V. R. R. Co. Operators, A. Pardee & Co.

Coal worked is the Big vein; average thickness 27 feet. This slope has been sunk to basin, but the present workings is about 60 yards above the bottom of the slope. Direction of gangways east and west. The E gangway is driven a considerable length, and several breasts opened in it. The W gangway is on a level with the E gangway of No. 3, and is connected by an air-way with the workings of No. 3. The ventilation is good, caused by 2 furnaces. This work accumulates a little fire-damp, but no one has been injured by it this year. The mine boss acts as fire boss.

The machinery consists of 1 hoisting engine of 60-horse power, 1 breaker engine of 15-horse power, and 1 pumping engine of 60-horse power; boilers 11. Air passes through the mines at the rate of 6,000 cubic feet per minute.

Peter Watson, mine boss.

No. 3 slope, south dip.—Length 1,062 feet; vertical 555 feet.—Land owners, L. V. R. R. Co. Operators, A. Pardee & Co.

This slope is sunk in the Big vein, and is on a level with the present workings of No. 1 slope, and connected with them. Tolerably ventilated; about 4,000 cubic feet of air passes through the workings per minute. The work is all on the west gangway.

The machinery consists of 1 hoisting engine of 80-horse power, 1 breaker engine of 15-horse power and 1 pumping engine of 100-horse power; boilers 11.

LAUREL HILL, HAZLETON, *Luzerne county.—Land owners, L. V. R. R. Co.—Operators, A. Pardee & Co.*

No. 4 slope, north dip. Length 543 feet; vertical 293 feet. This slope is used for pumping and hoisting men in and out of the mines; also the lumber used in the workings of Nos. 4 and 5 slopes.

No. 5 slope. Length 375 feet; vertical 293 feet. North dip. This slope is sunk through a rock to the place where the vein takes a rapid pitch, which accounts for its being shorter than No. 4. There are 3 tracks in this slope to the place where it strikes the vein, and two from there to the bottom, the third track takes the coal from the workings of No. 4 up into the breaker, which is a lift above the workings of No. 4. The workings of No. 4 are nearly all in the west gangway, and have many day falls, and ample natural ventilation. No. 5 has 2 gangways, east and west. The east gangway is nearly a mile in length, with a letting down plane in it. The west gangway is nearly the same length. The west side is well ventilated by a furnace. These are extensive works. Machinery, 3 hoisting engines of 190-horse power; 1 breaker engine of 20-horse power; 1 pumping engine of 60-horse power; and 2 large steam pumps; boilers, 20.

CRANBERRY SLOPE, HAZLETON, *Luzerne county.—Land owners, A. L. & E. Roberts.—Operators, A. Pardee & Co.*

The coal worked is the Big vein; average thickness 27 feet. There is not much work on the east side of the slope, only ripping the pillars out. West side gangway is driven in a considerable distance, in driving which great difficulties and obstacles were met with in the shape of rolls and faults, but they have been successful in getting into a fine field of coal. There are two gangways going on in it, one east and the other west. The east gangway met a roll in the basin, which turned it around to the south, and is at present going west. The west gangway proper keeps its course. This work is tolerably ventilated. Amount of air passing through the workings per minute is 8,500 cubic feet. Machinery, 1 hoisting engine of 60-horse power; 1 breaker engine of 20-horse power; 1 pumping engine of 60-horse power; boilers, 15, in good order.

Crystal Ridge Slope—length 444 feet, vertical 144 feet, north dip.—Land owners, A. D. & E. Roberts.—Operators, A. Pardee & Co.

This slope is nearly worked out. Ventilation good. New Crystal Ridge slope is worked by the same hoisting engine as the old Crystal Ridge slope. The rope passes over rollers on the surface to the new slope, which is driven through a rock to the coal vein. The coal from this slope is delivered to the bottom of the old slope, which is a lift above the bottom of the new slope. The bottom of this slope is down to the basin and there is not much work in it yet. There is a traveling way up to Cranberry west gangway for mules and men. The machinery consists of one hoisting engine of 40-horse power, breaker engine of 15-horse power, one pumping engine of 60-horse power, and 12 boilers. Total number of hands employed, 1,035.

Crystal Ridge No. 2 Slope.—Land owners, A. L. & E. Roberts.—Operators, A. Pardee & Co.

This is a new slope, sunk to bottom of basin, and coal brought up to old Crystal Ridge slope. This is a new work and not many are working in it as yet. Air good. The machinery consists of one hoisting engine of 40-horse power, and steam pump.

GOWEN COLLIERIES, *Luzerne county.*

These collieries are situated about 12 miles west of Hazleton and on the estate of the Roberts coal company. Operators, Roberts Run coal company.

No. 1 drift is now abandoned and a new slope sinking at the mouth of drift, from the surface, to reach a lift below the former workings. Average size of vein is 10 feet of good coal and of good quality.

No. 2 drift. This drift is on another vein lying over the vein in drift No. 1, of about 10 feet in thickness and about 2 feet of slate and dirt running in it, making about 8 feet of coal; this is of a good quality. No definite name is yet given to these veins, as they differ from all the other veins in the Lehigh region. They have a fine breaker built here, with an engine of 30-horse power and 3 boilers; 1 hoisting engine of 60-horse power, with two boilers, nearly new. Men and boys employed inside, 39; men and boys employed outside, 28; total, 67. Mules inside, 5; mules outside, 2; total. 7.

Lewis Rothermel, superintendent; A. Witchey, mine agent.

YORKTOWN COLLIERIES, *Carbon Co.—Land owners, New York and Lehigh Coal Company.—Operators, A. L. Mumper & Co.*

No. 1 slope, south dip. Length 780 feet. The coal worked is the Big vein; average thickness, 25 feet. The west gangway is driven to line and nearly worked out. A tunnel has been driven 65 yards in length, through slate and rock, to the Wharton vein, which is 8 feet in thickness. This vein lies underneath the Big vein. An airway was driven in this vein to the surface, passing through the property of the Frenchtown coal company, and which connects the workings of No. 1 with those of No. 2—Beaver Brook company.

The air is good in the Wharton vein but not so good in the east and west workings of the Big vein, which will ere long be worked out, owing to the south dip not proving workable. A breaker is attached to this slope.

David Thomas, mine boss; Richard Morris, outside foreman.

No. 2 slope, north dip. Length, 420 feet; Big vein breaker and engine; 1 hoisting engine, and a large steam pump. This slope will soon be abandoned.

No. 4 slope, north dip. Length, 330 feet; coal worked is the Wharton vein 8 feet thick. The coal from this slope is taken to No. 2 breaker. Air is rather weak, but will be better before long. An airway is in process near face of gangway to surface. This could not be effected sooner, owing to the gangway taking a turn south and east under the tips of No. 2, into the No. 5 basin. Morgan Moses, mine boss of Nos. 2 and 4; Evan Thomas, outside foreman.

No. 5 slope, south dip. Length, 390 feet; the coal worked is the Big vein.

Description.—This is a new slope, working the southern basin of this property. Direction of gangways east and west. The coal at present is brought to No. 2 breaker, until the new breaker on top of slope is completed.

Condition of air.—Air is good on the west side, but rather weak on the east side. A new airway to be driven down on the east side, instead of passing down the mainway as it now does. The west side is supplied with air by the exhaust from steam pump in an airway for the purpose, acting as a steam jet. A good traveling foreman in accordance with law. Evan Rees, mine boss.

The machinery of all the collieries consists of 4 hoisting engines of 200-horse power, 2 breaker engines of 40-horse power, 5 pumping engines of 535-horse power; total engines, 11; total horse power, 775; coal shipped, 156,000 tons; powder used, 1,680 kegs. Thomas John, superintendent.

JEANSVILLE COLLIERIES, *Luzerne and Carbon counties.—Land owners, the Spring Mountain coal company.—Operators, the Spring Mountain coal company.*

No. 1 slope, south dip. Length, 880 feet; vertical, 304 feet. These collieries comprise three slopes and 1 drift.

Description.—There are two veins worked in this slope, viz: The Big vein of 25 feet thickness, and the Wharton of 9 feet thickness. This slope is sunk in the Big vein, and a tunnel is driven to the Wharton vein. No gangways going on in the Big vein; the east side driven to line, and west side to a rising out in the vein. The gangway in the Wharton starts from the tunnel east and west. These gangways are driven on each side about 200 feet and a few breastings started. The vein looks well and the coal is of the best quality.

Condition of air good; 15,000 cubic feet per minute. Machinery, 1 hoisting engine of 100-horse power; pumping engine and a large steam pump of 460-horse power; total horse power of engines, 560; 1 large breaker with an engine of 25-horse power; A. Williams, mine boss.

Slope No. 3, south dip. Length, 420 feet; vertical, 144 feet. This slope is sunk in the Big vein, and a tunnel is driven across to the Wharton, with a gangway driven a considerable distance, but the Wharton does not prove well here. The Big vein is nearly worked out and ere long will be abandoned. The coal goes to No. 1 breaker. Machinery, 1 hoisting engine, 1 pumping engine. Condition of air good; average 3,000 cubic feet per minute passing through the mines; men and boys employed inside both slopes, 90; men and boys employed outside both slopes, 69; total, 159; mules, 24; coal shipped in 1872, 60,000 tons; powder used, 890 kegs; John Probert, mine boss; Wm. Morton, outside foreman.

Slope No. 4. This slope is a new one, sinking in the Big vein. Length at present is 135 yards, south dip. Will be sunk to basin before starting gangway. Machinery, 1 hoisting engine, 1 steam pump and 1 breaker engine; men and boys employed, about 20; powder used, about 100 kegs.

Slope No. 5, south dip. Length, 775 feet; vertical, 298 feet. This slope is sunk in the Big vein and a tunnel driven to Wharton vein, which is 10 feet thick. They have 2 gangways going east and west and several breastings. The coal is of excellent quality, with a range of 200 yards from this gangway to the Wharton drift gangway. But this will be parted into two ranges by putting a slope in the Wharton drift, taking one-half through the Wharton drift to breaker. No gangways in operation in the Big vein. The air in this work is good, about 20,000 cubic feet per minute. Still the air is weak in some portions of the workings, owing to so many openings caused by falling in. No. 5, No. 1 and No. 3 are sunk one in each basin and to bottom of basin in the Big vein, Wharton lying under the Big vein, therefore it will need slopes yet in each of these gangways to reach the different basins of Wharton. Machinery, 2 hoisting engines of 100-horse power; 1 breaker engine of 25-horse power; 1 pumping engine, 100-horse power; total horse power of engines is 225, and a large steam pump; coal shipped in 1872, 90,000 tons; powder used, 1,400 kegs; men and boys employed inside in No. 5 and No. 1 drift, 105; men and boys employed outside in No. 5 and No. 1 drift, 76; total, 181; mules, 26. William Morris, mine boss.

Tunnel No. 1, or Wharton drift. The workings above water level of this tunnel will soon be abandoned, but a slope will be sunk here in an air-way from No. 5 slope and an engine put on top to hoist the coal from one-half the range between these workings and that of No. 5 slope. Engine inside. Boilers to be at mouth of the tunnel. There are not many men working at present in this drift. Air is good. The coal goes to No. 5 breaker. The tunnel is ventilated by a furnace. The slopes are ventilated by exhaust from steam pumps. Coal shipped from all these collieries in 1872 is 150,000 tons; powder used, 2,390 kegs. J. C. Heyden, superintendent; Stuart M'Farling, mine agent.

COLERAINE COLLIERIES, *near Beaver Meadow, Carbon county.*

No. 1 breaker takes the coal from three drifts, one on the Big vein and two on the Wharton vein. These old workings are nearly worked out. The Wharton here is about ten feet thick with an excellent roof. A new slope is about to be sunk to take the place of the Wharton drift, on north dip, in south basin.

The machinery consists of one hoisting engine to hoist the coal out of a valley to a level with the breaker, and one breaker engine of 25-horse power.

Air good. Ventilated by a furnace. Coal shipped, 80,000 tons: powder used, 13,000 kegs; men and boys employed inside 84, outside 37, total, 121; mules, 29.

Slope No. 1, west dip.—The coal is the Big vein, length 1,080 feet, vertical 210 feet. Average thickness of vein is 25 feet, but has been found in some parts to double the bottom slate of one seam to form a top for the other. This work is rather extensive and tolerably ventilated by a fan. This slope works the middle basin, but has been connected with the northern basin by a tunnel through a ridge in the vein, not coming to surface at this point as it does at the top of the slope. It works a lift of that basin east and west of that tunnel, meeting east with the property of the old Beaver Meadow coal company, west with the property of the Spring Mountain coal company. Jeansville, east side, is as near as can be allowed to the line, as the old workings on the east side are full of water and there are no maps to show their extensions.

Slope No. 2, north dip.—Length 400 feet, vertical 320 feet. This slope is started from the surface near the top of No. 1. The workings are driven down to the bottom of the basin. This work is entirely new and will work both the north and south pitches. This will last for several years. A new air-way is now in progress in south pitch to the surface Ventilated by exhaustion from steam pump.

The machinery consists of two hoisting engines of 120-horse power, one breaker engine of 25-horse power, one pumping engine of 70-horse power on the top of a pumping shaft, one fan engine of 15-horse power; boilers 16. Coal shipped in 1872, 70,000 tons. Powder used, 1,095 kegs.

John Wear, superintendent; John Trevaskis, mine boss.

SOUTH SPRING MT. COLLIERIES, *Treskow, Carbon county.*

These collieries have changed hands of late, formerly they belonged to the German Pennsylvania coal co. They are owned at present by Samuel Bonnell, Jr. They consist of 4 slopes and one large breaker.

No. 2 slope, south dip.—Length, 450 feet. Coal worked is that of the Wharton vein; average thickness of vein, 9 feet. Air good to answer the number of men at work. At the face of the gangway the amount of air is 4,375 cubic feet per minute.

No. 6 slope, north dip. Four hundred and fifty feet in length. Coal worked is the Big vein; average thickness of which is 25 feet. This slope will soon be abandoned, for they are now taking the pillars out. The work is well ventilated. In face of workings the amount of air is 8,770 cubic feet per minute.

No. 5 slope, south dip. Two hundred and sixty feet in length. The vein here is the Big vein; average thickness of 25 feet. Gangways east and west from slope. East side nearly worked out. On the west side there are 2 gangways, one on each side of basin. Owing to the basin dipping west, these gangways are a considerable distance from each other. Before reaching the line to work this coal another slope must be sunk. Air is good at present, the amount of which traveling per minute is 5,000 cubic feet.

No. 6 slope, north dip.—Length, 440 feet. The coal worked in this slope is the Wharton, of 9 feet average thickness. The workings are nearly all on the east side of the slope. There are two gangways, one going east, the other curving around basin to south dip. The coal looks well and is of an excellent quality. This slope is ventilated by a furnace built in the out-take. Air good; amount at present, 6,000 cubic feet per minute. Men and boys employed in these collieries inside, 140; men and boys employed in these collieries outside, 140; total, 280. Mules, 22 inside; 20 outside; total, 42. Coal shipped in 1872, 94,458 tons. Power used, 2,108 kegs.

The machinery consists of 5 hoisting engine of 220-horse power, breaker engine, 5 pumping engines of 450-horse power, and 32 boilers.

T. N. Patterson, superintendent; Owen Evans, mine boss; George Spencer, outside foreman.

BEAVER MEADOW COLLIERIES, *Carbon Co.—Land owner, Hon. Tench Coxe.—Operators, Ellis Martin & Co.*

These works are composed of outside patch or pit, stripping the coal and quarrying it out, but for the present this is abandoned. This pit is on the L. V. R. R. company, or the old Beaver Meadow track.

No. 1 slope, north dip, and

No. 2 slope, south dip. These are shallow slopes to basin. The slopes commence on a ridge in the vein, but further west the ridge lowers down to a flat to the bottom of basin and the two basins join in a flat. A gangway is now in progress from No. 2 slope around the ridge to come into No. 1, and will be through by the middle of January, 1873. They have an excellent vein of coal in this place, of about 25 feet in thickness.

The machinery consists of one hoisting engine of 50-horse power, 1 breaker engine of 20-horse power, 2 steam pumps, and 6 boilers. The breaker engine and boilers are on the property of the L. V. R. R. Co. Coal shipped in 1872, 10,000 tons; powder used, 300 kegs.

John Martin, superintendent; Richard Gilbert, mine boss.

SUMMIT HILL COLLIERIES, *Carbon county.—Land owners and operators, Lehigh Coal and Navigation Company.*

No. 4 slope, south dip—length, 450 feet. The slope is sunk in the Mammoth or Big vein; average thickness 50 feet. This is a large and extensive work, and well conducted. The gangways are very long on the east, about one mile in length, and on the west 1,200 yards. The pillars on the west side have been taken out, reserving the gangway pillars to keep the gangway up as an air-course for the next lift, which the company is preparing to open by sinking a small slope near the bottom of the main slope on the west side. Outside an engine has been erected to hoist from the sinkers to the bottom of the present slope. The east side will be cut off by a new slope sunk in No. 5 tunnel. The ventilation on the west side is good; it is not so good on the east, because there are so many surface openings through which the air escapes. The works are ventilated by a fan of 15 feet in diameter on the east; west side is supplied with air by natural ventilation. Amount of air, on both sides, is about 20.000 cubic per minute.

The machinery consists of 2 pumping engines, one of 206-horse power, and the other 520-horse power; 2 hoisting engines, one of 120-horse power, and the other 100-horse power; 1 breaker engine of 30-horse power and 1 fan engine of 20-horse power; total horse power of engines 1,010; boilers 16, all in good condition.

Coal shipped in 1872, 84,477 tons 14 cwt.; powder used, 1,068 kegs; men and boys employed inside, 181, outside 138; total, 319. Mules inside, 23, outside, 11; total, 34. One locomotive of 14-horse power used outside, to take dirt to the dirt bank.

David Lawson, mine boss; Samuel Nevins, outside foreman.

TUNNEL, No. 5, SUMMIT HILL.—*Land owners and operators, Lehigh Coal and Navigation Company.*

Coal worked is the Big vein, which is about 40 feet thick. This tunnel has been driven through rock to the Big vein. It also crosses the Red Ash vein. The works at the end of the tunnel have been abandoned. No. 4 slope being a lift below these workings, and working under the gangways, the company have come back in the tunnel to the Red Ash vein, and have a gangway of nearly a mile in that vein, being tunnelled from the face of the Red Ash gangway through about 100 yards of rock to the face of the Big vein gangway, which extended the workings from this point nearly three-sixths of a mile. A locomotive engine of 40-horse power takes the coal from this tunnel through the Red Ash vein gangway out to the breaker, which is about a mile and a-quarter of road for the locomotive to work on. The coal is brought to a point to meet the locomotive by 23 mules. The work is well ventilated by a fan; there is one large breaker.

The machinery consists of 2 engines to work the breaker and hoist the coal to the top of it; one of 30-horse power, and one of 60-horse power; boilers 4, and all good. Coal shipped in 1872, 77,053 tons; powder used 877 kegs; men and boys employed inside, 156, outside, 120; total, 276. Amount of air in circulation, 16,000 cubic feet per minute.

George Davis, mine boss; Wm. Ratcliff, outside foreman.

Tunnel No. 6.—This tunnel is driven through rock and slate across the measures to the Red Ash and Big vein, into the mountain on the north side of Panther Creek valley. The work at the end of the tunnel is abandoned and a slope sunk down and worked a lift below the water level of this tunnel, and that also is abandoned. The present workings are opened from a gangway driven in the Red Ash for a considerable distance—about three-fourths of a mile. A tunnel is driven across the measures from the Red Ash to the Big vein, on the east side of No. 6 tunnel. The present workings are an extension from the tunnel driven from the Red Ash. So this tunnel works two veins, viz: Red Ash which is about 7 feet, and the Big vein, which is about 30 feet thick; but this is not all of the Big vein. A large slate has come into the vein and caused it to be unworkable to the bottom slate. This will be worked in some future time. When the top part is worked over, the Red Ash proves rather poor, here and there is not much work in it. A locomotive of 40-horse power takes the coal out of this work from a turn-out in the Big vein gangway to the breaker. The road is about 1¼ miles long.

The machinery consists of one breaker with two engines—one 20-horse power and one 30-horse power—with four good boilers. Coal shipped in 1872, 69,377 tons. Powder used, 815 kegs. Men and boys employed inside 170, outside 155, total 325.

Wm. H. Evans, mine boss; Moses Meiger, outside foreman.

No. 9 tunnel.—This tunnel is driven into the mountain, on the south side of Panther Creek Valley, cutting 7 veins of coal. The last, and the one worked at present, is the Big or Mammoth vein. The Red Ash has been worked in this, but at present is abandoned for some purpose best known to the company. Average thickness of Big vein, 60 feet; Red Ash about 9 feet. Total length of the tunnel is 215 feet. This colliery is operated by Thos. Phillips, for the L C. and N. Co. The work at present is above water level. A new slope will soon be sunk in this tunnel, as the company are preparing to sink near the end of the tunnel in the big vein. The present workings are in among the old workings, working the lower seam of the locally-called 4 feet, under a slate called the 18 inch, consequently the workings are very hot and take a great amount of air to keep them cool. The air is not what it should be to answer the heat of the working places; especially is this the case in the upper part of the work, which is on top of a balance plane. The other portion of the work is well ventilated. Amount of air in the in-take is about 25,000 cubic feet per minute.

Coal shipped in 1872, 68,936 tons; powder used, 1,500 kegs; men and boys employed inside, 137; men and boy employed outside, 100; total, 237. Mules, 32.

The machinery consists of 1 breaker, with 2 engines of 30-horse power, and 4 good boilers.

Thomas D. Jones, superintendent and outside foreman; Thomas Thomas, mine boss.

Mt. Tunnel.—This tunnel is driven into the mountain above No. 6 tunnel to work the crop of the same vein. The coal was not worked to bottom slate in the old workings of No. 6; 2 seams or benches were left locally called 4 feet and yard veins. A slate parts them from the other part of the vein. This work is operated by contract. The coal is delivered to No. 6 breaker by a balance plane, from a level with the tunnel, and is prepared with the coal of No. 6 tunnel.

Room Run Mines, *Nesquehoning, Carbon county.*

No. 1 shaft.—Depth, 300 feet. This shaft has until late worked the Big vein. A tunnel has been driven to the Red Ash vein. At present the workings of Big vein are all on the west side of shaft. The Red Ash on east side. The tunnel proved to go under the basin of the Red Ash vein, so a plane was driven up to bottom of basin, through which the Red Ash coal is let down to the tunnel on east side of Big vein gangway, through which it is taken to bottom of shaft. This work yields a great quantity of carbonate hydrogen gas, (fire-damp,) es-

pecially the Big vein. This work was stopped for some time to drive a new airway, the ventilation not being sufficient to clear the old and new workings, owing to the air escaping through day-falls. This was driven in a little vein locally called the crack. This vein lies 10 or 12 feet below the Big vein. It is better ventilated at present; we have at present about 8,000 cubic feet of air on the west side and about 3,500 cubic feet on the east side. The west side gangway is ventilated by a 15 foot fan, and the east side by natural ventilation, from a traveling way to old No. 1 tunnel, which is the second opening for this shaft. Machinery, 1 hoisting engine of 100-horse-power; 1 pumping engine of 387 horse-power; 1 fan engine of 10 horse-power; boilers, 8. William Watkins, mine boss.

Room Run slope, No. 3.—This slope is sunk in the Red Ash vein; thickness, 10 feet. A tunnel is driven from the Red Ash to Big vein. The Red Ash work is nearly all abandoned. At present the work is nearly all in the Big vein. The tunnel is driven south and the gangways east and west from it. All the work is on the west side of slope. The workings produce a little fire-damp. The air is good, averaging about 18,000 cubic feet per minute. The Red Ash gangway is in faulty ground, and has been stopped for some time. The Big vein does not prove well, but the company are still progressing forward with gangways and breasts, in hopes of meeting better success. The work is not very extensive. The work is ventilated by a 15 feet fan. Amount of air circulating, 10,000 cubic feet per minute. Machinery, 1 hoisting engine of 65 horse-power; 1 pumping engine of 157-horse power; 1 fan engine of 15-horse power; boilers, 6. William Smitham, mine boss.

Room Run slope, No. 4, south pitch.—This slope is driven down in the Big vein from the top of a saddle in the vein that comes to the surface at this point, near the shaft, but on a contrary pitch to the workings of the shaft. This slope is driven down to a fault in the vein and two gangways are driven off of it east and west. The east gangway struck the fault and is stopped. The west gangway is in trouble, but is still carried on. The air is rather weak in this work, but there are only a few men working in this slope. If the vein proves well, ample ventilation will be produced. The machinery consists of one hoisting engine of 29-horse power and one pumping engine of 29-horse power. Steam to work them is conveyed from the shaft boilers.

Tunnel No. 2.—This is now in progress to cross the basin of No. 4, to catch the north pitch of the Red Ash vein. This is also situated near the shaft and passes it about 15 feet from the top. The breaker is situated about three-fourths of a mile from the workings of the mines. A locomotive of 58-horse power is here used to take the coal from the mines to the breaker; one breaker engine of 65-horse power, and four boilers at breaker.

Men and boys employed in all these workings, inside 166, outside 118, total 284. Mules used, 32. Coal shipped, 68,597 tons. Powder used, 1,097 kegs.

W. D. Zehner, general superintendent; James Smitham, assistant; Richard Eustice, outside foreman.

REPORT

OF THE

COLLIERIES IN AND FOR THE MIDDLE DISTRICT OF LUZERNE AND CARBON COUNTIES, FOR THE YEAR ENDING DECEMBER 31, 1872.

OFFICE OF INSPECTOR OF COAL MINES,
WILKESBARRE, PA., *Feb.* 1, 1873.

To His Excellency, J. F. HARTRANFT,

Governor of the Commonwealth of Pennsylvania:

SIR:—In compliance with the requirements of an act of the General Assembly of 1870, I have the honor to submit herewith my annual report of accidents producing death or serious personal injury to persons employed in and around coal mines in the Middle district of Luzerne and Carbon counties, for the year ending December 31, 1872.

In my report of 1871 a general report only of the condition of the district was made. This year a brief report is made concerning the condition of each mine, in an alphabetical order of their operators, *i. e.* as far as the same relates to the health and safety of persons employed in it. Also a list of the prosecutions that took place during the year, after which the coal production of the district is given and a recapitulation of the accidents, which are tabulated. Also two maps, intended to assist in explaining the cause of the accidents to which they relate, &c.

Very respectfully,
Your obedient servant,
T. M. WILLIAMS, *Inspector of Mines.*

BLAKE & CO.'S SHAFT.

West Pittston shaft.—This shaft is located at the western end of West Pittston, and is 270 feet deep. There has been no work done in the above mine since the dreadful calamity of May, 1871, except pumping, which has been also abandoned since the spring of 1872, and the erecting of the new fan, which is 21 feet in diameter, for which they were preparing room when the fire took place.

A new breaker has been built about 200 feet away from the old shaft. The first new shaft, which was begun south of the old one for a second opening, has been abandoned, and another new one commenced — feet west of the old one, which is being sunk rapidly and is down at present about 150 feet, and may be connected to the old shaft in 1873.

CONSUMERS' COAL COMPANY'S SHAFT.

East Boston shaft.—This shaft is located a short distance north of Kingston, and is 160 feet deep. In 1870 the mine was operated by Mr. Charles Hutcheson, lessee, and had but a single opening. Since April, 1871, the company have been working the mine themselves, and have made their second opening by sinking a new shaft to the depth of 170 feet. This year they htve put in ladders in said second opening.

There is also a communication between this and the Hutcheson shaft, in regard to which there has been much trouble and litigation between the company and Mr. Hutcheson.

Last spring notice was given to Mr. W. G. Payne, superintendent in charge, to have the mine better ventilated, and some suggestions were given as to what improvements should be made so as to obtain the desired result. The same was faithfully promised, but notwithstanding the time given, of several months' duration, Mr. Payne insisted in moving an old ten-feet fan to the new shaft, running the same by wire rope transmission of power, and even now, after having spent as much capital as would have been required to have built and put into operation a good fan 15 feet in diameter, the mine is so very poorly ventilated that I was inclined to apply for an injunction to have it stopped in November, the time of my last visit. I could not find but 12,000 cubic feet of air at the foot of the air shaft, and could not find sufficient air current to run the instrument, in the cross-cuts, at any point near the face of the mine. I had to condemn a brake that had been put on the hoisting drum, after much time and money had been spent, as it would not answer the purpose. In a word, much trouble is had in having things done at all, and much more in having anything done satisfactorily. The mine is not yet in a satisfactory condition, either as regards ventilation or the safety appliances attched to the machinery for hoisting and lowering persons.

Mr. Wm. G. Payne, superintendent in charge; Wm. Evans, mining boss.

A. J. Davis & Co.'s Mines.

Warrior Run.—These mines are located as their name indicates, at Warrior Run, and consists of two drifts, now abandoned, and two slopes, one of which is on the Red or B vein, 300 feet long, which is a new work not much opened, and the other on the E vein, from which they have a tunnel south to the D vein. The latter slope workings are ventilated by a fan 15 feet in diameter. Their mines have been lying idle this year until the month of November.

Mr. Jas. E. Roderick, general superintendent; John C. Jones, mining boss.

Delaware and Hudson Canal Co.'s Mines.

These mines consist of four slopes, three shafts and 1 tunnel, to wit:

Baltimore, No. 1 tunnel.—This mine is located about 1¼ miles south-east of Wilkesbarre and was driven into the Baltimore vein. Their present workings are in a slope some 1,200 feet long, commencing at a point a little east of the tunnel, inside. This mine has lost much time during 1872; had some heavy and damaging falls of roof, and subsequently was drowned out for a long time. They had to drive a second opening, owing to the above mentioned fall closing the old one, also a new traveling road had to be made for the same reason. The ventilation is not very commendable, yet I have received no complaints. Natural ventilation, 19,200 cubic feet. Number of persons employed inside, 78.

A. Nicolls, general superintendent; Wm. M'Gregor, assistant superintendent; Jas. Tretheway, mining boss.

Baltimore, No. 2 shaft.—This mine is located east of and adjoining the No. 1 tunnel mine. It is a shaft 80 feet deep and has near its bottom, a little westward, a slope —— feet long. Another part of the mine is worked through a tunnel which has an inside slope.

This mine has been working about 30 years and evolves a small quantity of carburrated hydrogen gas (fire-damp.) Several persons have been slightly burnt in this mine, caused generally through their own carelessness.

Ventilation.—Produced by natural means; 19,470 cubic feet per minute at inlet; at face of mine, 9,260 cubic feet of air per minute. Number of persons employed, 82.

A. Nicolls, general superintendent; Wm. M'Gregor, assistant superintendent; Ed. Hahn, mining boss.

Baltimore, No. 3 slope.—This mine is located east of and adjoining No. 2 shaft of the Co.'s mines. It is a slope on the Baltimore vein, ——— feet long, and

evolves a small quantity of fire-damp. It has a good traveling road, (made in 1871,) for the ingress and egress of persons employed.

Ventilation.—This mine is well ventilated considering that it is done by natural means, without the assistance of any mechanical or artificial means. No. of persons employed, 120.

A. Nicolls, general superintendent; Wm. M'Gregor, assistant superintendent; Wm. W. Reese, mining boss.

Laurel Run slope.—This mine is located near a small village called Laurel Run, about 2¼ miles south-east of Wilkesbarre. There is but one mine between it and the No. 3 Baltimore of the same company. It is a slope on the Baltimore vein, which is split at this point. It has three lifts and has a good traveling road for the ingress and egress of persons employed. The top bed, which is just being opened out, generates explosive gases, but there has not been any discovered in the lower seam as yet.

Condition.—The mine is in a tolerably good condition. The seams are small. 5 or 6 feet in thickness, and take much powder to mine them, thereby requiring a large amount of air to carry off the powder smoke.

All the stoppings along the slope, between the main gangways and their parallel air-ways, are being re-built with stone and morter instead of wooden brattice, producing very good results.

Ventilation.—Amount of air at inlet, 69,800 cubic feet, and at face of mine, 39,500 cubic feet per minute. Number of persons employed inside, 161.

A. Nicolls, general superintendent; Wm. M'Gregor, assistant superintendent: Hugh M'Donald, mining boss.

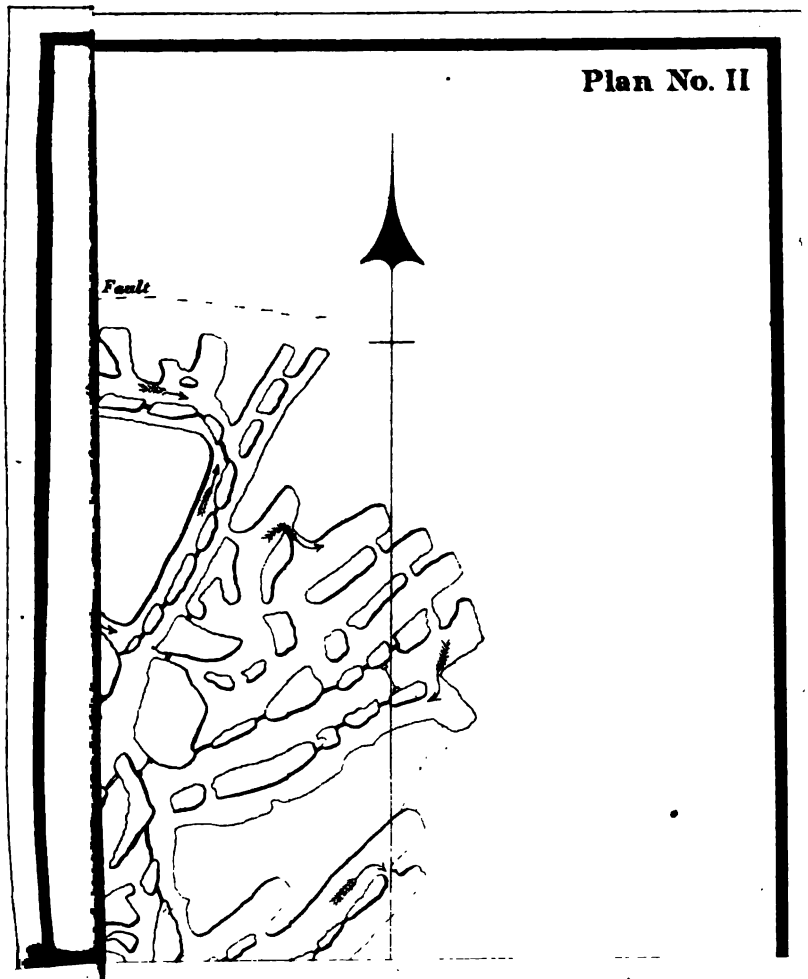
Pine Ridge Shaft.—This colliery is located east of Wilkesbarre, and near Milners' station.

It is a shaft 400 feet deep sunk into the lower bed of the Baltimore vein. This mine gives off great quantities of carburetted hydrogen, (fire-damp,) as may be seen from the following:

On the 11th day of May, 1872, an explosion of fire-damp by which four persons named David Davis, David Morgan, Thomas Morgan and Evan Davis were fearfully burned, resulting in the death of David Davis and David Morgan. The other two survived, but are much disfigured and crippled in the hands for life to all appearance. On the 13th I examined that portion of the mine where the accident occurred, in company with John J. Moore and others. We found that one of the workmen at the time of the accident, was in the act of taking down some coal over a check A in tunnel, which caused him to let said check-door open for a short time. In the meantime a party of the company's mine surveyors descended the shaft and not meeting the boss at the foot, they proceeded at once to make their way into that part of the mine where they had been making a survey the days previous. They had no idea of any great danger in traveling this road, as they had been led out over the same road the evening previous by the mine boss, to avoid the inconvenience of passing so many cars on the main road, while they had their surveying instruments to carry with them; but just as they were almost through the air-way on the top vein, and near the main road, the explosion above mentioned took place. We then measured the air passing through the top vein, when the door A in the tunnel was open. We tried it for twenty minutes. Gas accumulated three feet deep for quite a distance along the roof in the air-way—air passing through at the time of its accumulation 9,120 cubic feet per minute. We then closed said door A and found that the gas would ignite in the lamp (safety) for eight or ten minutes at the point where the explosion took place, and that while there were 16,320 cubic feet of air per minute passing.

We then measured all the air passing in through the tunnel at C, a part of which had to pass over the check-door A, the balance through the air-way in top vein just mentioned, at B, and found 33,862 cubic feet of air per minute passing.

We found that if check-door A would be left open, the more air would enter through the under vein D and pass through door frame of A and tunnel C; notwithstanding this, the gas would ignite at the door A from a lamp on a person's head, there being a large gas-feeder in the roof at that point, besides decreasing the quantity passing in at the top vein B, thereby allowing the gas to accumulate therein. The person that was taking down the coal over door A was doing it according to instructions from his boss, neither of whom thought for a moment of any person traveling in through the top vein B, which had such strong gas feeders so that it was not used for traveling; still the air was circulated through and no danger was anticipated, even should any one travel through the same from the shaft, which was only a distance of some 400 or 500 feet.



d by a double fan, or two fans built upon the same shaft, each ten feet

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TILDEN FOUNDATIONS
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shaft, which w[illegible] ace of some 400 or 500 feet.

The party of engineers acted on the supposition that it was just as safe at that time, as it was the evening previous. There is one thing certain, that this alarming accident might have been avoided, had the suggestions and instructions of the inspector been acted upon and carried out, as the attention of the mine boss Moore, and the assistant superintendent M'Gregor, had been called to the great danger of leaving the air that was required to keep the top vein B clear of gas, travel into the other part of the working mine, October 19, 1871, and requested them to have a separate split of air for the top vein B, so that the great quantity of gas it generated might have been conveyed to the return air-way immediately; this having been done the calamity would not have occurred in my opinion.

The top vein is extraordinary fiery in this basin. While they were driving or opening the gangways in the top vein B, the gas would ignite by the discharge of each blast, and a hose 2½ inches in diameter, had to be kept attached to the pump column, to be used in putting out the fire after each blast. At one time Mr. Moore and I measured 25,000 cubic feet of air per minute passing through tunnel C; notwithstanding this amount of air, the gas would ignite two feet from the roof, at any point, for 50 feet or more along the main intake road. The same air passed into the other part of the mine north and east, as can be seen in plan No. 2, accompanying this report; the arrows showing the direction of the air current.

The return F—in plan No. 2—requested since October, 1871, from B to E, has been completed since the accident—which had to be driven entirely without the use of gunpowder a distance of about 130 feet. A number of other improvements have been suggested and promise to be done, and some of them are now being done, to wit: A separate split of air for the workings north of the fault, which is between this mine and Mill Creek mine. A shorter road for a traveling and safety (or escape) road from the east side of the shaft at the point H, (on plan,) towards the second opening, a distance of 500 feet, and leading to the Mill Creek mine by way of second opening at point I—a separate split of air from the new slope (marked L on plan) to the upcast at M. A new return air-way along the anticlimal axis from the proposed escape road H, at point K, to the main shaft, a distance of 550 feet.

There is a fan 20 feet in diameter in this mine, and exhausts from 70,000 to 75,000 cubic feet of air per minute, at its usual speed of 75 or 80 revolutions, and a double fan at Mill Creek mines, exhausting about 120,000 cubic feet of air per minute. There is another fan of 20 feet diameter being built, to take part of the air from Mill Creek mine, and part from Pine Ridge mine, to ventilate that part of the mine (Pine Ridge) north of the fault lying between the two mines.

In 1870, the Pine Ridge fan only exhausted 49,500 cubic feet of air per minute, there being a square box about 12 or 15 feet area for the air to return through up the shaft to the fan. Since that time the aforementioned box has been taken out, and one whole compartment of the shaft partitioned off for air, with the present favorable results of over 70,000 cubic feet of air per minute.

A. Nicholls, general superintendent; —— Simpson, assistant superintendent at present; Jno. I. Moore, mining boss.

Mill Creek slope.—This colliery is located about 3 miles north-east of Wilkesbarre, and consists of one slope and one drift, both on the same vein—Baltimore split. The slope has five lifts on the lower seam or bed, besides having three tunnels through which they are working the top seam. The most part of these workings generate explosive gas more or less, but there are some parts that give off extraordinary large quantities of gas, about equal to the Pine Ridge workings.

Condition.—The mine is the largest in this district, and notwithstanding the large amount of gas evolved, it is kept in order generally.

There are several fire-bosses kept by day, and one by night. The working parts of the mine are travelled daily by these officers in their respective districts, in strict accordance with law, besides travelling the old workings about once per week, and in this manner the mine is always kept clear of standing gas.

In order to satisfy myself of the correctness of the officer's report of the condition of this mine, I have at different times—after travelling the working part—traveled through the old workings, but did not find any standing gas, except at one time, immediately after an explosion had taken place; in that case it was a natural consequence, the air-ways being deranged.

Ventilation.—This mine has a larger volumn of air circulated than any other in this district. It is so divided and sub-divided, that each part has its own split of fresh air. The mine is well arranged for ventilation, having a large and roomy up-cast shaft 12×14 feet. It has 7 or 8 separate splits, and 4 in-takes. It is ventilated by a double fan, or two fans built upon the same shaft, each ten feet in

diameter; when being run as at present, about 180 revolutions per minute, it exhausts about 123,000 cubic feet of air per minute, with a water gauge of .8 of an inch. The other new fan is not quite ready, it is 20 feet diameter. Number of persons employed inside 128.

Air report for December.—Inlet 135,800; face of mine 73,700 cubic feet of air per minute; fan revolutions 180. The drift workings are in good condition; they do not generate so much gas as the slope workings; number of persons employed 58. The ventilation is produced by a furnace. Amount of air at out-let about 30,000; face of mine 20,000.

A. Nicholls, general superintendent; Mr. Simptson, assistant superintendent; John E. Cock, mining boss since July, 1872.

Young's slope.—This mine is new. It is located half a mile east of Wilkesbarre. It is a slope just sunk, on the Hillman vein. The gangways east and west have been started preparatory to driving for a second opening. A new breaker is now being built, which will be ready to break coal early in the spring of 1873.

Conyngham shaft.—This is a new shaft, located a short distance north-east of Wilkesbarre, and is down about 516 feet. There is some very fine masonry at the head of this shaft, which is divided off into five compartments, two for hoisting coal, one to place the pumps in, one for repairing pumps, &c., besides hoisting and lowering of men and machinery, and one compartment for air. Dimensions 42×13 feet. Mr. Philip Repp, contractor.

Delaware, Lackawanna and Western Railroad Company's Mines.

Boston shaft.—This mine is located about one mile and a-half north-west of Kingston, on the Baltimore vein, which is split at this point. The shaft is 160 feet deep.

Condition.—This mine is kept generally in good condition. One important improvement has been made by building stone and mortar stoppings instead of wooden ones. The only complaint now is too long a route for the air to travel, it being coursed in one current around the whole mine.

The power used to create ventilation is a furnace, dimensions 8 feet, fire grate bars, width 7 feet, and usually moves about 35,000 cubic feet of air per minute at the furnace, and 14,000 at face of mine. This furnace is favorably located, having about 274 of air column to heat before it reaches the surface, and 18 feet of a stack on top of air shaft, total 272 feet, which gives it advantage over some of the furnaces in use elsewhere in this district, most of which moves from 16,000 to 20,000 cubic feet per minute.

The following experiments were made on this furnace in December, 1870, by my solicitation, and assisted by the following gentlemen: Messrs. C. S. Snyder, Head Engineer for the D. L. and W. R. R. Co.'s works, and Benjamin Hughes, General Superintendent of mines for the same company, both the above from Scranton; also R. P. Rothwell, M. and C. Engineer, Wilkesbarre, and myself.

The furnace is located about —— feet away from the down cast or main shaft, and is nearly level with the foot of the same. Dimensions of furnace: Length of fire bars 8 feet, width of fire grate 7, area=56 square feet; ash pit 3 feet below the fire bars; from fire bars to spring of arch 2½ feet; and 6 feet from grate bars to arch, which has 3½ feet radius. The furnace was fired up only six days per week, and it burned 4 mine car loads of coal during that time, equal to two-thirds of a car load per day of 24 hours. The mine car contained 95-83 cubic feet of coal, exclusive of toping, which made it=105.5 cubic feet, and equal to 422 cubic feet per six days. This coal was loaded especially for the use of the furnace.

Air Measurements.—A small instrument of the Cassella make and one of the Biram four inch anemometers were used with the following result:

In six consecutive trials the Cassella instrument indicated a velocity of 720.67 feet per minute. Table of correction used—6=714 cubic feet. The Biram instrument indicated $\sqrt{}$ =598.33×.97+47=627 cubic feet.

Area 57.375×$\sqrt{}$627=35,954 cubic feet per minute.

Area 57.375×$\sqrt{}$714=41,054 cubic feet per minute.

The water gauge on main gangway door, about 300 feet from furnace and about the same from down cast shaft, indicated .25 of an inch. Hence, by taking the average of the measurements of both instruments, which=38,504 cubic feet of air per minute × by the water gauge, .25×5.2+83,000=1.516 P.

It is difficult to say how many cubic feet of coal should be allowed for a ton, as we had no means to ascertain at the time, but will assume it at 40 cubic feet, hence the following:

422÷(40×6)=1.7583 tons per day of 24 hours. Therefore, $\frac{2{,}240\times1.7533}{1.516\times24}=109.7$ lbs. per horse power per hour.

This does not take into account the difference between the temperature of the mine and that of the outside which was 3°.

In connection with the above figures it may not be out of place here to state that the above results are nearly similar to what was found in England.

It will be seen by referring to the "Transactions of the North of England Institute of Mining Engineers," for April 10th, 1868, page 102, that a Mr. Morrison gave a table of experiments that had been conducted to compare the work of a Guibal fan and a furnace, when it was claimed that the annual expense was reduced in favor of the former £100. Also, the following table exhibiting the effective power:

EFFECTIVE POWER.

	Coal consumed per fortnight.....	Coal consumed per 24 hours.....	Coal consumed per hour, average.....	Coal consumed per horse power per hour.....	Horse power in air at bottom of upcast.....	Cubic ft. of air per minute,	Water gauge at bottom of shaft.....
	Tons.	*T. cwt. qr. lbs*	*Lbs.*	*Lbs.*	*H. P.*	*Cubic feet.*	*Inches.*
Furnace...	96	6 17 0 16	640	101.75	6.29	36,350	1.1
Fan.....	62	4 8 2 8	413	19.82	20.83	64,700	2.05

B. Hughes, general mining superintendent; Thomas D. Davis, assistant; James George, mining boss.

Jersey mine.—This mine is located a short distance north-west of Plymouth, and has a tunnel opening into the Red Ash vein. All the coals are hoisted by a slope to the water level, and are brought to the surface through the aforesaid tunnel.

Condition.—The condition of this mine has not been flattering to any person interested in it, although somewhat better perhaps now than it has been hitherto. A new air shaft 230 feet deep has been sunk; and a fan similar to that at Avondale is in contemplation, which will give better ventilation than this mine has had in the past. A new travelling road has been made there; also a good wash house, furnished with hot and cold water, and a stove, all of which are kept in good order. B. Hughes, general superintendent of mines; F. J. Phillips, mine boss.

Avondale shaft. This colliery is located about two and a-half miles west of Plymouth. It is 237 feet deep, and sunk into the Red Ash vein.

Condition.—This mine has been kept in a very good condition ever since it was re-built after the calamity of 1869, and is better arranged than most of the mines; yet there is one important part that has been overlooked in this, as in the majority of other mines, to wit: No preparation for the protection of the air currents, by having double doors so as to keep the currents steady; this is very difficult to do unless provided for in the opening out of the mine. The hoisting carriages were provided with bridle chains and safety catches. The gates were put on at the head of the shaft, and a brake on the hoisting drum prior to my first visit, in 1870, all of which were of the best kind in use, except the brake, which has since been replaced by a better one. It has 400 pounds dead weight upon a compound lever, and is conveniently placed; it will bring the pair of engines, 14 inch cylinders, to a dead stand with a full head of steam, (80 pounds pressure,) and the load in a revolution and a half of the drum. I would here state that there is one more change desirable to this brake, so as to have it arranged in a manner that it can be used independent of the dead weight, as a brake is seldom used when there is dead weight attached to it, unless in a case of emergency, when the engineer is very liable—not being accustomed to the use of his brake—to forget that he has one, hence I prefer an efficient lever brake, that may be used

in letting down persons or material, whereby the engineer becomes accustomed to the use of his brake. However, Mr. Preedhoe, the master machinist under the Deleware, Lackawanna and Western Company, on this line, is entitled to credit for the manner in which he built his brakes, as they were about the third good brakes built in the district, and the first of this kind.

Ventilation.—The power used to cause a circulation in this mine, since the wood work was rebuilt, is a fan 12 feet in diameter, sheet iron casings, revolving disc and open periphery which exhausts from the mine about 38,000 or 40,000 cubic feet of air per minute. This air is conducted around the mine, in two different splits or currents, one east and one west; number of persons employed inside 138. There has not been much improvement made during last year, except in the building of all the stoppings, between the main air-ways and gangways with stone and mortar, which assists very much in keeping the air to the face of the mine, besides being much cheaper than the old wooden ones.

Elliot & Co's Colliery.

Hollenback Colliery.—This is a slope located on the plank road, Plainville township, and is sunk on the Hillman vein. It is a small colliery working around and stripping a fault to the dip of the old Hillman mines, besides mining a small tract of coal lying between them, and the mines of the Seneca Lake coal company, south of them.

Condition.—Nothing very important can be pointed out in the shape of improvements since my first visit.

There are but few persons employed inside. Ventilation at inlet, 14,500 cubic feet; at face of mine, 7,000; number of persons employed, 20 inside. No mechanical or artificial means used to assist ventilation.

Robert Pool, general superintendent; Thos. E. Morpeth, mining boss.

Franklin Coal Company's Mines.

Brown's slope.—This slope is located a short distance south of Wilkesbarre, and is opened on the Baltimore vein.

Condition, &c.—The coal is hoisted to an old water level gangway. It is then brought to the surface through a tunnel. This mine has been idle a long time this year. The men are not allowed to travel the slope, there being a traveling road for that purpose. The mine is tolerably safe. They have some very poor roof, but it is generally well timbered. Otherwise it is about the same as when the last report was made.

Ventilation.—It is produced by having a small furnace, which moves about 13,620 cubic feet of air per minute at outlet; at face of mine, 12,350 cubic feet; number of persons employed inside, 75.

A new tunnel has been driven from the water level gangway into the Red Ash vein, from which they may be able to mine some coal in 1873.

R. R. Morgan, general superintendent; Wm. Thomas, assistant superintendent; Samuel Thomas, mining boss.

Old slope.—This slope is located a short distance east of the Brown's slope, on the same vein and nearly adjoining. There is also an underground slope to this mine. This mine is tolerably safe, there being but a small amount of gas generated, and there is a reasonably good current of fresh air circulated through the whole mine. Power used to create circulation is a fan 12 feet in diameter, which discharges about 30,000 cubic feet of air per minute. Number of persons employed inside, 93.

R. R. Morgan, general superintendent; Wm. Thomas, assistant superintendent; John D. Hughes, mining boss.

Hillman & Sons' Colliery.

This colliery is located about two miles east of Wilkesbarre, between the Mill Creek and the back road. It is a slope upon the Hillman vein, so called because this firm worked it on the plank road for many years. This vein is being very extensively worked along the plank road at present.

Condition.—This mine gives off a small quantity of fire-damp, but its general condition is good.

Ventilation.—There is plenty of pure air in this mine. It is a new and very shallow mine, and has a fan 12 feet in diameter, which discharges about 25,000 cubic feet of air per minute. Number of persons employed inside, 40.

H. B. Hillman, general superintendent; George Ferteig, mining boss.

Lehigh Coal and Navigation Company's Mines.

Slope No. 3.—This slope is located a short distance west of Wanamie, on the Ross vein. It has been lying idle for many months this year.

There is a small quantity of fire-damp generated in this mine; however, there should not be any trouble in ventilating the same, as there is a fan 15 feet in diameter there which exhausts at present about 28,700 cubic feet of air per minute and may be increased when needed.

The mine is tolerably well arranged at present. The fan has been put up in a very good style and will give good results when put to the test. It was built in the company's shops in this place, under the superintendence of Mr. C. Calvin, master machinist. Number of persons employed inside, 87.

J. Smith, general superintendent; Jas. Waddle, mining superintendent; Evan E. Jones, mining boss.

No. 2 *drift.*—This drift is located west of Wanamie and near the No. 1 breaker, on a vein called the 7 feet. The measures being somewhat confused in this end of the valley to what they are elsewhere, few persons make any pretensions at locating these veins geologically. Hence I may state that this vein overlies the one worked in the No. 3 slope, called the Ross vein.

Condition and ventilation.—This drift is in better condition at present than it had been. It is a small place, not many persons employed, and in such cases it is often difficult to have the same attention paid to them as to larger ones. There is no fan or furnace used to create a draft or current, but two small sections or rings of an old steam boiler, 2½ feet in diameter each, with a grate placed in the bottom, are put in one of the old chambers that has been worked out, having a small hole to the surface. Ventilation report for December, 6,000 cubic feet at face of mine. Number of persons employed, 16.

J. Smith, general superintendent; Jas. Waddle, mining superintendent; J. C. Edwards, mining boss.

No. 1 *slope.*—This slope is located west of Wanamie, and near foot of plane at No. 1 breaker. It is supposed by many that the vein worked in this slope is the same as that worked in the 7 feet drift. The slope has been sunk another new lift this summer, and they are only just opening out the same for ventilation.

The following is the report for December: 7,600 cubic feet at face of mine. Number of persons employed inside, 14.

J. C. Edwards, mining boss.

No. 1. *tunnel.*—This tunnel was first opened into the vein worked in the slope, and since has been driven through what is supposed to be the Ross vein, and into the measures where it is claimed the Red Ash vein should be; but the ground seems much confused and the seams which were found are small, hence it is difficult to identify the measures or veins at this point. No coal is being taken out of this tunnel except what little is taken from the top vein.

J. C. Edwards, mining boss.

No. 1 *drift.*—This drift is opened on the same vein and adjoining the No. 1 slope.

Condition and ventilation.—There has been a little improvement made in this mine this year, by forcing the air-current more to the face of the mines. A furnace is used to create circulation, which moves 22,000 cubic feet of air per minute.

J. Smith, general superintendent; Jas. Waddle, mining superintendent; J. C. Edwards, mining boss.

No. 2 slope.—This mine is located at the eastern end of the village of Wanamie, and near the No. 2 breaker. It is opened into a vein supposed by some to be the same vein as that in drift No. 1; others differ and claim it to be an overlying vein.

Condition and ventilation.—This slope has been worked but a short time this year. Early in the spring a fan 15 feet in diameter was put up there, which exhausted a considerable amount of air; but having been put up in haste, and not having the proper arrangements, such as large air-ways and cross-cuts, it could not be expected to give the desired relief to the persons employed, or satisfaction to the bosses, that it would if it was well put up, and otherwise well provided for. The interior part of the mine was in very great need of better ventilation. The cross-cuts were too small, not as many doors as there should be to force the air to the face of the mine, and the old ones badly constructed; the stoppings were very badly made up, where they were made, and the whole mine was in a very unsatisfactory condition. The most of the above deficiencies having been pointed out, and ordered to be remedied on several occasions; but it seemed as if there was great indifference or inability on the part of the officers in charge.

J. B. Smith, general superintendent; James Waddle, mining superintendent; George Sager, mining boss.

Slope No. 4.—This is a new slope, located north of Wanamie a short distance. It has not been worked since the first part of the year.

Smith and Waddle, general superintendents.

Nottingham Shaft.—This shaft is located within the borough of Plymouth. It is sunk into the Red Ash vein, and is about 400 feet deep.

Ventilation and condition.—The ventilation of this mine has been improved within the past year, by having a 15 feet fan, instead of a 10 feet fan, which exhausts more air from the mine. The same was put at so great a distance from the workings, which were very badly opened, that the amount of air put into circulation, about 25,000 cubic feet per minute, is very much reduced before it reaches the face of the mine, as a great deal of the same leaks out before it can be used, nevertheless there are some hopes of having things better in the future, as the superintendent, H. C. Brodhead, and the mine boss, J. Johns, are endeavoring to have those complaints remedied. There has been a great many of the old wooden stoppings re-built with stone and mortar, and all the new ones are being built of this material. Many new doors have been put up, some as double doors, and others as check doors; in this way they are improving things gradually, and will be much better after the 24 feet fan is erected and connected to this mine, which will be done early next spring. Number of persons employed 103.

John Johns, mining boss.

Washington Colliery.

This colliery is located a short distance north-west of Plymouth, and consists of a slope and a tunnel. The tunnel workings are above water level, and are adjoining the old workings that have been worked out in all directions to the crop of the vein. The vein pitches about 35 or 40°.

Ventilation in this mine has not been satisfactory to the Inspector up to this time.

There is a small furnace built under the supervision of Mr. Charles Smith, in the employ of Broderick & Co., which is located close to the gangway side, to create circulation. It is difficult to decide which is the worse, the construction or location of the same.

The whole of the mine shows evidence that it has been badly managed up to the present time. Whatever may be done under the administration of the present firm and its officers remains to be seen.

Slope No. 1.—The slope is located near the entrance of the tunnel. It is sunk upon the same vein that is being worked in the tunnel and shaft—Red Ash. There are two lifts being worked in the slope. On the first lift eastward a large fault was met, through which a tunnel has been driven into the vein north of the fault.

That part of the mine opened north of said fault is being ventilated by a current of air that passes through it from the Nottingham shaft workings, towards

a fan 15 feet in diameter, which is placed on an old lift 300 feet above this level. Said air is not healthy for persons to breathe after having traveled said (Nottingham) mine. The whole amount of air circulated is about 25,000 cubic feet per minute, and it has to ventilate the shaft workings and those north of the fault, whereby it has to do for about 140 persons between both places.

The two lifts working on the west side of the slope have been ventilated by a small iron-cased exhaustion fan 4½ feet in diameter, and running at a very high speed, which has been removed preparatory to having the 24 feet fan put up in its place.

The air has not been quite so bad in this part as in the tunnel workings, although it was poor enough. There have been some improvements made in the slope workings on both sides, since the present firm has had possession of the place; such as the building of good stone and mortar stoppings in many places and putting up main doors anew with heavy frames and built around with stone and mortar. All the stoppings between the main gangways and air-ways are now being built in this substantial manner.

There will be plenty of pure air in this mine after the new fan above mentioned is erected. It is to ventilate the Nottingham shaft workings and the workings of this slope.

H. C. Brodhead, general superintendent; A. Reese, mining boss.

Slope No. 2.—This is a new slope located a short distance west of the breaker of the Washington mines and near the foot of the Jersey mines' plane. This slope is being sunk through rock and is down at present about 350 feet. It may reach the Red Ash vein in about 200 feet more. It is being done under the supervision of H. C. Brodhead, general superintendent over all the Lackawanna Coal and Navigation Company's mines on the Plymouth side of the Susquehanna river.

Hutchison & Co.'s Shaft.

This colliery is located about a mile and a quarter north-east of Kingston. It is sunk about 170 feet on to the same vein that is being worked in the next shaft west of them, and is called by some the Cooper vein. This mine is considered tolerably safe; roof being good and no fire-damp discovered as yet.

Ventilation.—This is produced by a fan 15 feet diameter. The mine has been opened in such a manner that it will always be difficult to properly ventilate it, and up to this time, although comparatively a new mine, no satisfaction has been given to the inspector in the matter of ventilation. The fan is large enough to exhaust at least 60,000 cubic feet of air per minute, while being driven at about 100 revolutions, while at present there is only 22,000 cubic feet per minute passing into the return near foot of shaft; how much is being lost in the shaft I know not; and about 8,000 cubic feet per minute traversing the face of the mine. The vein is about 6 or 7 feet in thickness, works rather hard, and requires much powder to loosen the same, and must necessarily make a large amount of powder smoke. Number of persons employed, 60. Charles Hutchison, general superintendent; James Hutchison, mining boss, successor to Mr. William M'Culloch, who had charge of opening the mine.

Hillside Coal and Iron Company.

Enterprise mines.—This colliery is located on the Plank road, Plainsville township, and consists of one slope on the Hillman vein, and a shaft about 150 deep to the Five Feet vein.

Slope workings, their condition and ventilation.—These workings are not as safe as many of our other mines. In the first place there is very bad roof, requiring a great deal of care on the part of the miner and his boss; however the mine is well timbered, and all precautions are being taken to secure the safety of the men. Very few accidents occur, which must be attributed mostly to the great care and vigilance of the parties above mentioned. There is a small quantity of gas generated in this mine, but it has not given much trouble so far. The venti-

lation is not as good as it should be, although it is much better than it was in 1870, before the new fan was put up at the shaft. Number of persons employed, 82.

Ventilation.—Amount of air at inlet 9,360 cubic feet per minute.

J. H. Swoyer, general superintendent; William M'Culloch, mining superintendent; Frank M'Cabe, mining boss.

Shaft workings.—The shaft is sunk into the Five Feet vein, which was abandoned after having been worked a short time; after which a slope, 400 feet long, was sunk across the measures into the Baltimore vein, the beds of which are divided by about 8 feet of slate and bone. There is considerable gas generated in the top bed, and there has been much trouble to get a lawful *second opening* to this mine. A gangway was driven westward nearly to the boundary line, and a slope sunk nearly parallel with the same to the depth of 400 feet, for the purpose of connecting with the workings of the Henry shaft west of it. For some reason best known to the parties themselves, this slope was discontinued, and is now filled up with water.

Since that time another out-let has been driven parallel with the hoisting slope, 200 feet apart, out into the Five Feet vein, a distance of 400 feet through rock. There is a tunnel from the Five Feet into the Hillman vein, and a road from there to the surface. The high water sometimes trouble them, and it is now in contemplation to continue the second opening from the Five Feet across the measure to the Hillman vein, and perhaps to the surface, so as to be able to close the aforementioned tunnel, to guard against the high water in the spring and fall.

Ventilation.—This slope is being ventilated by a fan 15 feet in diameter, placed at the head of the shaft. Number of persons employed 50. Amount of cubic feet of air per minute at out-let, 15,110; at face of mine, 10,400.

J. H. Swoyer, general superintendent; Wm. M'Culloch, mining superintendent, and Philip M'Cabe, mining boss.

Port Bowkley slope.—This colliery is located on the plank road, and consists of two slopes; one to the surface, which is being supplied with coal from another underground slope.

In 1870, this was one of the poorest ventilated mines in the region, but a fan 15 feet in diameter was put up, which has made a great change in its ventilation. There is some fire-damp generated in this mine, but with proper care and good management, there is no reason to apprehend any difficulty or danger therefrom.

Fearing that some danger might take place from a thin rock covering on the vein when near the river edge, I requested the mine superintendent to ascertain the vertical height from the coal seam to the surface, thence to ascertain what depth of wash is over said rock, which would show at once the thickness of rock overlying the coal. This course was deemed necessary, as many persons apprehended trouble from sand-bars, &c., about the present or former bed of the river. The leveling and boring having been done, a wash of 80 feet was found over the rock, which leaves about 85 feet of rock covering over the vein.

I called their (bosses) attention to the workings under the canal, and the officers claim that they are well timbered wherever they have worked under it.

During my visit I noticed many of the log cabins or shanties built, which they state were built to support the roof under the canal.

Number of persons employed, 79. Amount of air at outlet, 36,000 cubic feet per minute; amount at face of mines, 16,760 cubic feet.

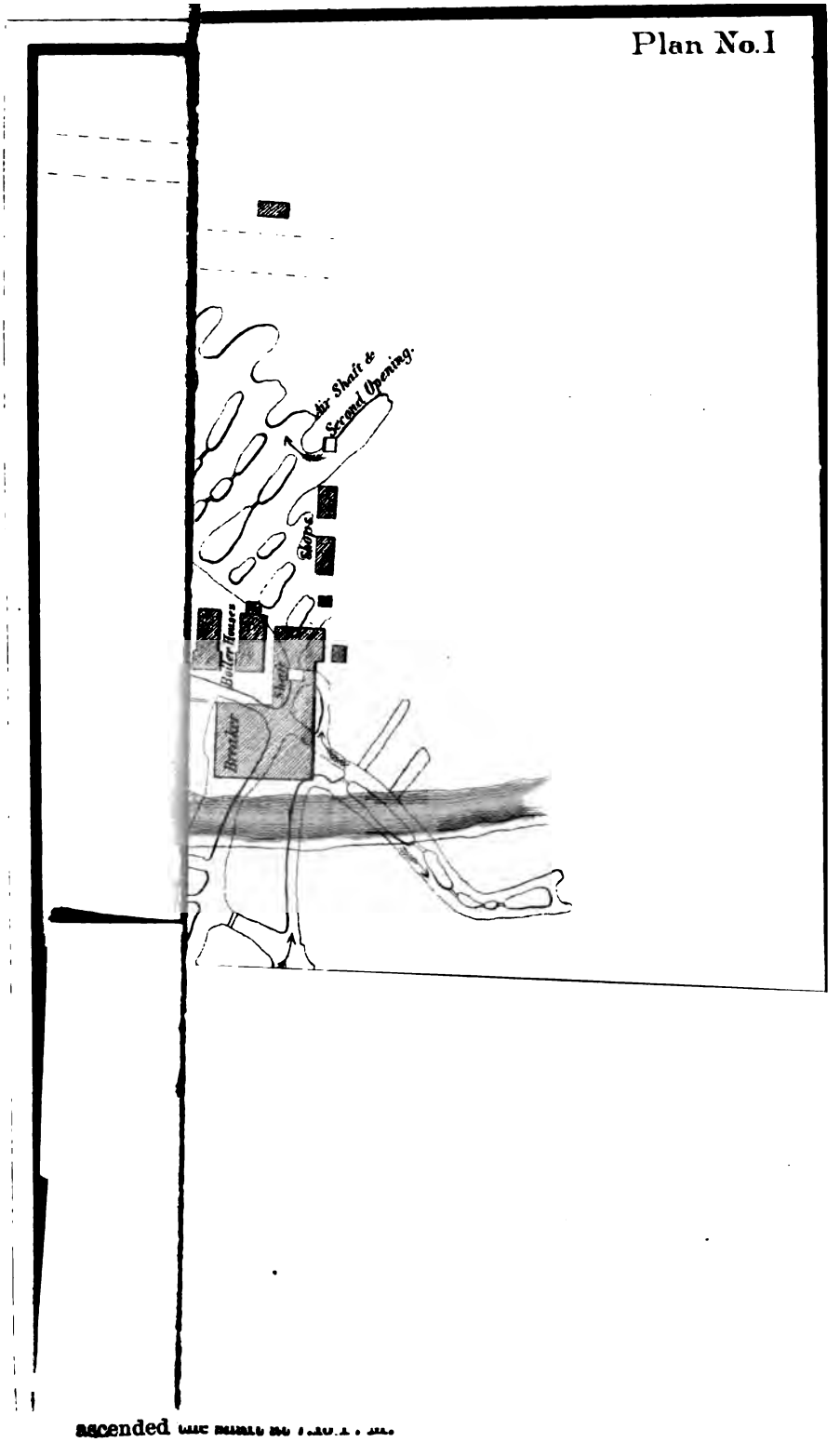
J. H. Swoyer, general superintendent; Wm. M'Culloch, mining superintendent; John J. Meahan, mining boss.

Luzerne Coal and Iron Company's Mines.

Burrough's shaft.—This mine is located on the plank road, in Plainville township. It is a shaft 80 feet in depth and sunk into the Hillman vein and worked loose into the adjoining mine (Enterprise.) It is abandoned since June, 1872.

This mine had a cave-in of a part of its roof on the morning of July 4, 1871, which let in the water from the canal, whereby this and the adjoining (Enterprise) mine were inundated, and remained idle therefrom for a length of time. It being a holiday no person was at work; had there been the usual number, some lives might have been lost. In due time the breach was closed up as secure as could be, to all appearances, and work resumed and continued until its abandonment.

Plan No. I



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I examined the interior part of the mine near the locality of the cave, on two different occasions, in company with the mine boss, Nichols, and others, and observed that there had been an immense amount of timbering and filling done under the canal, in places that looked in any way weakened from any cause. I did not see any deficiency in that particular. I have in my possession a map of the same up to the time it was abandoned. The parties owning the adjoining mine east, called my attention to the fact that if the water was left to fill up this mine it would eventually run over to their workings, the Enterprise; and further, that if at any future time another cave-in of the roof should take place in this old and abandoned mine, by which a large body of water would be let in, it must overflow and enter the Enterprise mine. I answered the party thus: "That as far as damages to property from such an event is concerned, I did not think I had anything to do with it, but if they apprehended any danger to the lives or limbs of their employees from any cause that came within my jurisdiction, I would cheerfully co-operate to have the same looked after." The party referred to answered "No; that no immediate danger appeared to them; but could not see how the mines would be likely to continue without having falls of roof and perhaps bring in the water as before, since there would be no person to look after it, to timber, &c., it being abandoned and partially filled with water." I then promised to submit the matter to my counsel, H. W. Palmer, which I did. He told me that in his opinion I had nothing to do with the mine after they had abandoned it, but that it was a legal matter between the two parties, and thought that any party has the right to abandon a working and are not compelled to keep the same in repair for any further time; and thus the matter now stands.

F. Mercur, general superintendent for the L. C. and I. Co.

Henry shaft.—This colliery is located on the Plank road, Plainsville township. It is a shaft 400 feet in depth, and has been sunk through the Hillman to the top bed of the Baltimore vein, on which the mine was first opened. A tunnel has been driven from foot of shaft south into the under bed, which is very fiery, and a connection has been effected with the second opening by sinking the second opening shaft of the top vein from the top to the lower bed of the Baltimore vein, and an air-way driven from the tunnel under said shaft.

On the sixth day of February, 1872, a serious explosion of fire-damp took place in this mine, which resulted in the death of four persons, as follow:—Robert Hays, Robert Morris and Patrick M'Culloch, also Michael Barret, who ignited the gas, but he lived three or four days after the explosion.

The explosion occurred as near as could be learned about as follows:—The mine had been lying idle for some time except for repairing which was being done at the time. The Luzerne coal and iron company not having had the mine very long, and desirous of making many changes in the manner of working the same, were putting in new roads and a different kind of mine cars. The mine boss, John Nicolls, who had been looking after this place for two or three years, was in charge of the mine, and Mr. F. Mercur, general superintendent. On the morning of the calamity, the four men above mentioned descended the shaft as usual, and proceeded on their way into that part of the mine known as the middle lift, where their place of working was, and where they had been at work some days previous, which was on the main road, and on the same level as the foot of the main shaft. Mr. Collins who was in charge of the gang, he being the head track layer, had occasion to remain in the rear of the party as they came near their place of working, and before he had time to catch up to them again, a terrific explosion took place. Immediately some other men that were in another part of the mine, also repairing, on hearing the explosion, ran to the spot where it occurred and found Messrs. Collins, Barrett, M'Colloch and Hays, immediately. Mr. Collins was not much the worse; Mr Barret was fearfully burnt, and died in a few days; the latter two were dead when found. The fourth, Mr. Morris, was not found for several hours, he having fell at the inside end of a fall of roof on the gangway, where he could not be got at without going around through the cross-cuts of the chambers. This was done when a fresh lot of men came to assist; he was dead when found, and in all probability had not lived long, if any time, after the explosion. At 12 A. M. of the same date, I was informed of the sad calamity, but was too sick to leave my bed until the next day at noon, when, in company with Mr. J. W. Miles, I proceeded to the mine. Messrs. Miles, Coryell and Evans accompanied me through that part of the mine where the explosion took place. We descended the shaft at 3 P. M., and after having examined the parts where it was supposed that the gas was ignited, we ascended the shaft at 7.15 P. M.

On the 8th, an inquest was to be held. E. B. Harvey, J. P., acting as coroner, appointed the following persons as jurors, to wit:—R. C. Mitchel, E. O. Baker, Robert Mullighan, John Gray, Michael Walsh and Francis Murphy; after recognising the bodies of the deceased Robert Morris, Robert Hays and Patrick M'Colloch, they adjourned to meet at the office of the acting coroner, after the burial at 5 P. M., at which time another adjournment took place to meet at 9 o'clock on the morning of the 9th, at the house of Mr. Michael Barret.

On the 9th the jury met at the appointed time and place and took the testimony of Mr. Barrett, who stated that he was the person who it was that ignited the fire-damp, and that he was at the main door A and in the act of opening it when the gas ignited, and that after the explosion had passed over he ran back over the rubbish along the gangway for quite a distance. He stated further that there was no fire boss in that part of the mine this day, nor had Mr. Robert Hayes been requested to act as such to his knowledge, and did not see a safety lamp with any person this day, and had not seen any gas at this point while at work there the day previous, they being on the main road did not apprehend any danger from fire-damp.

After taking the above testimony the jury proceeded to the office of E. B. Harvey, J. P., acting coroner, where the inquisition was continued to its completion, (the acting coroner having since died I have been able to get a copy of all the testimony,) when the following verdict was rendered by the jury:

COMMONWEALTH OF PENNSYLVANIA, } ss:
Luzerne County, }

An inquisition indented and taken at Plainsville, in the county of Luzerne, the eighth day of February, in the year of our Lord one thousand eight hundred and seventy-two, before me, E. B. Harvey, a justice of the peace in and for said county, acting as coroner, upon the view of the bodies of Robert Hays, Patrick M'Cullough and Richard Norris, then and there lying dead, upon the oath of Robert Mitchell, Michael Welch, E. O. Baker, John Gray, Robert Milligan and Frank Murphy, good and lawful men of the county aforesaid, who being sworn and affirmed to inquire, on the part of the Commonwealth, when, where, how and after what manner the said Robert Hays, Patrick M'Cullough and Richard Norris came to their death, do say, upon their oath and affirmation, that the said Robert Hays, Patrick M'Cullough and Richard Norris were killed and Michael Barrett seriously injured by the explosion of fire-damp or carburetted hydrogen in the Henry colliery on the morning of Tuesday, the sixth day of February, A. D. 1872, and agree:

First.—That the explosion was the result of a want of care in carrying out the requirements of the ventilation law, as by examining the mines before the men went to their work.

Second.—That if there had been that required and careful examination of the mines before the men went to their work, the explosion would not have transpired.

Third.—That John Nichols, mining boss, possessing the right to hire a fire boss, should have had one, or should have performed the duty of examining the mines himself, and thus averted the explosion.

Fourth.—That John Nichols is a competent mining superintendent, and did not neglect having an assistant or fire boss, nor omit performing the requirements of the law, willfully or from malice, but from an over-devotion to the company's pecuniary interest.

Fifth.—That from the testimony of witnesses the Luzerne coal and iron company, the present owners of the said Henry colliery, under the careful management and supervision of Fred. Marcus, Esq., superintendent, and T. M. Williams, mine inspector, since June 16, 1871, have been and are now making improvements and repairs, which, if completed, will perfect the ventilation of said mines and make it safe for the miners, so long as the appointees perform their duty.

Sixth.—That the owners of said colliery are not careful enough to see and know that their bosses and appointees fully keep and perform all the requirements of the ventilation law.

In witness whereof, the aforesaid acting coroner and the jurors aforesaid have to this inquisition put their hand and seals this ninth day of February, Anno Domini one thousand eight hundred and seventy-two, at Wilkesbarre, county and State aforesaid.

E. B. HARVEY,
Justice of the peace and acting coroner.

R. C. MITCHELL,
E. O. BARKER,
ROBERT MULLIGHAN,
JOHN GRAY,
MICHAEL WELSH,
FRANCIS MURPHY.

In addition to the above I would give the following as my humble opinion of how the sad affair took place, together with my reasons for the same. The most violent part of the explosion must have been at a point a little inside of the door A on plan 2, about the chamber B, where there had been some great force piling, &c., against the rib on the lower side of the gangway, which blew a wooden brattice and a stone wall out of a cross-cut that was between the gangway and the air-way, into the latter as clear as if it had been shoveled therefrom. In the said chamber B many timbers had been blown out and some of the roof had fallen. In chamber A the force of the blast seemed to have entered it from chamber B, blowing the timber, &c., in the same direction through cross-cut No. 2. In chamber C the indications were just the reverse, looking as if the force had been inward just as it had been outward in chamber A. The No. 2 cross-cut in chamber A was near the face, while No. 1 cross-cut was further back. The air (if there were any in circulation) traveling inward would naturally strike some distance ahead of cross-cut No. 2.

The distance from cross-cuts Nos. 1, 2 and 3 can be seen by referring to plan of mine. The breadth of the chamber can also be seen. The thickness of vein is about 7½ feet, and pitching there about 7° or 8°, but there is one other matter to be mentioned in regard to this chamber B, that cross-cut No. 3 was not cut through the top coal bench, hence it would help to dam back the gas down to the level of the cross-cut top before the air would get hold of it. No trace of fire could be seen along the gangway, or at any point inside of chamber C, there being pieces of paper lying along the gangway and loose powder having been blown over and scattered at one place but not ignited.

That part at door A being as low, if not lower than from there to face of gangway, I am of opinion that if the gas had filled to this point, it would have been through the inside chambers, and the gangway, down to and level with the place where it was ignited, as it would pass inward through the cross-cuts before it could fill down to the gangway, we did not see any indications of there having been such a body ignited. And further, had there been such a body of gas ignited by any person opening the door A, it would have been impossible for him to have lived any longer than the blast would have been in reaching him, as this door was at the junction of the air-way and gangway, and all the workings inside it, except one chamber; hence the whole force would concentrate in this direction, being an air channel. Again, it is very difficult to think that any person could have lived to come from the door A, under the circumstances which Mr. Barret escaped immediate death, as every thing were swept away for a long distance, and dashed to pieces against the curved side or rib, even the heavy door frame, 12 inch square timber, was blown and carried 25 or 30 feet along the gangway.

In conclusion, I would give it as my decided opinion, that the gas was ignited in chamber A, from which it spread to chamber B, where there might have been a sufficient quantity of gas above, and from cross-cuts 2 and 3 to face of chamber, to have produced the results above described. This being the reservoir, as the effect was shown in blowing the timber outward into chamber A, and inward into chamber C, and a person igniting it in chamber A, might have been saved much better there than at any other point near the scene of the accident. This, in my opinion, accounts how Mr. Barret, who ignited the gas, fared at the time better than the other three men who were on the gangway, and who were instantly killed.

Now the next question naturally asked is, how came the gas to accumulate in any such quantities? By referring to the plan of the mine, it will be seen that the air current at that time traversed inward through the chambers, from the down-cast air shaft X (or second opening shaft) to the face of the gangway; it was then conveyed along a new air-way as a return to the point where the said new air-way formed a junction with the main gangway near the door A, from whence it was to travel the main gangway as a return until it came to the cross-cut or air-way No. 4, which connected the upper with the lower workings, *i. e.*, when the current would be going in its usual course. It seemed from what some of the witnesses stated, that door B, just outside the connecting air-way No. 4 had not been very carefully closed the evening previous, when these men quit work; the reason they gave for it was that the road having been newly put down, and not yet filled up between the sills, there was quite a space left under the door, and the road being a little higher than in the past, the door would not close tight, they knowing that no persons were working, did not take extra care to close it, and thus it was left. This door being a single one, and not one of a pair, it let

part, at least, of the current to take the short and most natural road through door B into air-way No. 4 instead of around the face of the mine, which reduced the quantity travelling in that direction, how much no one is supposed to know. The reason Mr. Nicholls gave for having but a single door on the gangway at B to protect the current at this point was, "that the mine or gangway at this point had been driven, most part of it, through a rock fault, in some places no coal at all, other parts had thin coal as shown on plan, but that they were then endeavoring to connect chamber E with workings on top of plane F, in order to correct this matter, and had been doing all they could to improve the condition of the place ever since the L. C. and T. Co. got possession, and that they had also opened the new air-way from door A inward, so as to avoid the necessity of having the return air on the main gangway, which they thought to have connected to a chamber marked H, which was being driven parallel with the gangway from air-way No. 4 inward, so as to make it a complete return."

Up to the time of the explosion this mine had been very badly arranged. It is true that the faults, &c., made it difficult, nevertheless, the general plan of the mine and the manner in which it was being worked were wrong in principle.

I entered my protest against the manner of ventilation each time I visited the mine, although I did not find standing gas therein but once. I condemned it to Mr. Jas. Thomas, superintendent in charge, and to Mr. John Nichols, the mine boss, for I have always opposed the idea of coursing the air-current first through the chambers, even when there are parallel air-ways with the gangways, but still more so when a mine has no such air-ways, and where the main gangway is made the return for the smoke and foul of the mine. If an explosion or fire takes place, the after-damp and gases are met in the main gangway, the very place where the pure air is required the most, to keep the fresh men in good condition and to recussitate those that may be effected by said gases.

This had in contemplation a new fan, 18 feet in diameter, to be placed at the new shaft at X on plan, but it was not quite ready. There was a small propulsion fan at the hoisting shaft that had been in use, but had been abandoned, leaving the whole hoisting shaft to be an up-cast and the new shaft to be the down-cast.

The following was the air report for December, 1871, (the mine was not working in January:) Amount at face of mine, 12,500 cubic feet of air per minute; amount at outlet, 18,000 cubic feet of air per minute. I must say that this company were endeavoring to improve matters from the time they took possession.

In regard to the matter of fire-boss, had there been one, as the law especially provides for, it is more than likely that the sad catastrophe would not have occurred. That it was one of many serious accidents that have occurred in our coal mines from the effect of bad management, including loose discipline and a want of proper respect for the ventilation law, few will deny.

Since the accident the new fan has been put up, and was built by Mr. Snyder, Pottsville, and gives the following result: Fan dimensions, 18 feet in diameter, 6 feet wide, centre opening 9 feet in diameter. Upright engine, first motion, cylinder, 18 inches diameter; stroke, 2 feet. When fan is running 56 revolutions it gives about 56,000 cubic feet per minute. Number of persons employed at present, 72.

F. Mercur, general superintendent; Jenkin B. Jones, mining boss at present.

Prospect shaft.—This shaft is located east of Wilkesbarre, between the back road and the plank road. It is 600 feet deep and sunk into the Baltimore bed. No coal has or can be sent from this mine for some time, the breaker not being quite ready; and the shaft having been newly sunk, will take some time to have the mine properly opened. Mr. Mercur showed me the plan on which he purposes to have the same opened, which, should it be carried out, will undoubtedly prove a good one.

This mine generates some fire-damp. There appears to be ample provision made to ventilate the same, as there is a fan 20 feet in diameter put up there of Mr. Weightman's design, and built by Snyder, Pottsville, Pa.

The fan is put up in the most substantial manner, and is being driven by an upright engine, first motion, 18-inch cylinder. The engine house is built of stone, not a stick of timber, except what sustains the roof, to be seen in the building. The fan house adjoining is built nearly in the same manner. The fan is enclosed on the sides with stone and brick, the periphery with cast iron plates, and a sheet iron stack 15 feet high. The head house of the shaft is composed of a few pieces of timber, braced and bolted together in a simple yet substantial manner, with an iron ladder firmly and permanently placed to ascend the same for the purpose

of oiling the sheaves, around which there is an iron railing around the top of the frame where it is necessary for any person to travel. It has no roof of any kind. The breaker is being built several hundred feet away from the shaft.

The hoisting is being done by a pair of first motion engines of Snyder's, Pottsville, Pa., make. The cylinders of which are 24 inches diameter, 6 feet stroke. The drum is of cast iron, with groves on it for the wire rope, which is 8 feet diameter in centre, and 12 feet at each end. There is a very powerful brake attached to the drum, the handle of which is conveniently placed to the engineer. This brake has already been found to be very useful and has been well tested; on one occasion the engineer found that he had no control of his engine while hoisting, there being something the matter with the valve, he immediately applied his brakes, and stopped the engine until he had his engine again in order.

Oak Wood shaft.—This is a new shaft, a second opening, that is being sunk about half a mile or more east of the present shaft, which is down now about 40 feet. It has about 700 feet to go to reach the coal it is so stated. F. Mercur, general superintendent; John Nicholls, mining boss.

Exeter shaft.—This shaft is located a short distance west of the West Pittston old shaft, and is being sunk for a second opening for the same. It is down at present about 150 feet, or about half way down to the coal. F. Mercur, general superintendent.

Maltby's Shaft.

This shaft is a new one, and is located a short distance below Wyoming town, near the turnpike road leading from Kingston to Pittston. It was began in 1871, remained idle through the winter, and work resumed again in the spring of 1872; but it has since been abandoned for the present. This is a circular shaft 20 feet in diameter, built of a brick wall 22 inches thick, set in cement, and coated with a heavy coat of cement on the outside, making a smooth surface to it, so that it may easier pass downward through the sand and gravel. The wall aforementioned is firmly bolted together by a number of wrought-iron rods that are placed in the centre of the wall, and each 13 feet in length, at which distance a cast-iron plate — inches thick is placed in the wall around the whole shaft, it being cast in segments. Each of the rods are fastened through the cast-iron plate, and a distance of 3 or 4 inches is left between the ends of the rods of the adjoining sections. The brick work is built in layers of 6 or 8 feet at a time, which is being done above the surface, the weight of the wall, &c., pressing it down into the sand or loose ground below, as the same was being hoisted by bucket or otherwise.

There was a difficulty experienced in connection with the wall. When they had built about 70 feet of it it was found to be giving way. In the lower part a breach was discovered in the wall, being broken and apart several inches, which occurred by the breaking and crumbling of the cast-iron plates, caused probably by the manner in which the rods were placed through the cast-iron plates, the whole weight being thrown upon that part of the plate between the top end of one rod and the bottom end of the other, together with the enormous side-pressure due from quicksand and water. The rock at this point is 160 feet below the surface; hence it is quite an hazardous undertaking in the manner proposed. It is now contemplated to start and build another wall inside the present, and continue it until the rock is reached; also, to commence a second shaft at a distance to make it a lawful second opening for the former. The latter proposed shaft may be sunk much easier than the former, the ground being sandy; consequently the sinking of the first will lesson the quantity of water to be contended with in the second. The whole work done has been under the supervision of Mr. O. C. Fowler, general superintendent for S. C. Maltby, Esq., proprietor.

Maltby old mines.—These mines consist of the Maltby old shaft and a water level drift. The old shaft is located a short distance north of the new shaft, near the back road. It was abandoned by S. C. Maltby in 1870. Since that time Wilner & Co. leased the small vein above water level in the shaft, and have subsequently opened a drift on the mountain side, on the same vein that was being worked in the shaft in 1870, and is supposed to be the vein next overlying the Pittston big vein. In the drift very little work has been done. There are a few chambers opened on each, some of which are worked up and through into an old drift higher up on the mountain side.

The firm of Wilner & Co. having failed late in the fall, Mr. Maltby has taken hold of the whole concern once more, with the intention of driving a tunnel from the small vein now being worked in the shaft to the under one. O. C. Fowler, general superintendent,

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Mocanaqua Coal Company's Mines.

These mines are located near Shickshinny, and consist of three drifts. There has not been any work done in these mines during this year. These mines being situated as they are, several hundred feet above the level of the river, are easily ventilated, there being no gases to contend with; the greatest danger is met by sudden falls of pieces of the roof, which is very irregular.

Ventilation was produced by a small furnace, and sometimes only by natural means. A fan was in contemplation just before their stopping. A. J. Cohen, general superintendent; Z. Kreiger, mining boss.

Mineral Spring Coal Company's Mine.

This colliery is located east of Wilkesbarre, Pa., and is bounded on the east by the Laurel run, and on the west by the Baltimore No. 3 mines. It is a slope on the Baltimore vein, split; the two veins being worked separate, which are in some places 28 feet, and in other places only a few feet apart. The top vein generates fire-damp in small quantities.

Condition and ventilation.—This mine is tolerably safe, roof being generally good, and not much gas to contend with. Two furnaces are in use to create ventilation, both moving a current of about 34,000 cubic feet of air per minute. Amount at face of mine, 27,000 cubic feet. Number of persons employed inside 68. There has been some improvements made in forcing more of the air through the faces of the working places than heretofore, by building stone and mortar stoppings instead of wooden ones, and other changes. A. J. Davis, Esq., successor to Mr. J. R. Davis, general superintendent; Wm. Cobly, mining boss.

New Jersey Coal Company's Mines.

These mines are located a short distance west of Ashley borough, and consist of two collieries Nos. 1 and 2. The No. 1 colliery is located about one mile west of Ashley, and consists of one slope and one tunnel. This colliery has not been worked any during the year 1872. F. Barnes, general superintendent.

No. 2 colliery.—This colliery is located a little nearer the borough of Ashley, and consists of one drift opened on the Red Ash vein. There was a slope also upon the same vein, but it has been abandoned, and the coal is being taken all out the drift at present. There has been but very little work done in this mine during the year 1872, except supplying a local trade. They did not ship coal until the month of November.

Ventilation.—This is rather scarce and has always been so in this mine. The vein has been very irregular in parts of this mine and the work done there is much of the same character. A small furnace is being used to create circulation. Frank Barnes, general superintendent; Thos. Hughes, mining boss.

Northern Coal and Iron Company's Mines.

These mines are five in number, but only four of them shipping any coal as yet.

No. 1 shaft.—This colliery is located a short distance east of the borough of Plymouth. It is sunk 295 feet. There are two veins being worked in this shaft—the Lance and the Cooper. The lower or Cooper bed generates a small quantity of fire-damp.

Condition and ventilation.—These workings are considered tolerably safe, except that there is bad roof on the Lance vein. Ventilation is produced by a fan 12 feet in diameter, which exhausts from the mine, (in both veins,) about 50,000 cubic feet of air per minute, but which is not being conveyed through the faces of the different parts of the mine as well as when I made my last report. The mines are being enlarged, hence there is a greater distance for the air to travel, which causes more friction and more pressure upon the stoppings, which, having been made of wood, are giving out, although not two years old many of them, causing heavy leakages. Number of persons employed in both veins inside, 130.

C. Shavar, acting general superintendent; A. Weir, mining boss.

No. 2 shaft.—This colliery is located east of and adjoining No. 1 shaft workings. The shafts are about 650 feet apart. This shaft is sunk to the depth of about 500 feet. There are two veins being worked, the Lawler and Wilkman veins having met with some irregularities of the seams, not much work has been done there. They commenced shipping coal last spring, but again suspended everything except driving the main gangways and air-ways.

The ventilation is produced by a fan 12 feet in diameter, which is built similar to the fan at No. 1. No. of persons employed inside at present, 23.

C. Sharar, general superintendent, (acting;) A. Weir, mining boss.

No. 3 shaft.—This shaft is located about one mile east of No. 2 shaft. This shaft is sunk about 350 feet. It is intended to work the Cooper and Bennet veins. A second opening is being driven to it from the Boston shaft workings.

Contractor—T. C. Harkness, Esq.

No. 4 shaft.—This shaft (locally known as the Sweatland shaft) is located about one mile north of Plymouth. This colliery is an old one, but has had its shaft retimbered and new carriages and engines provided, since the N. C. & I. Co. took possession. The vein worked in this shaft is the Bennet.

Condition and ventilation.—The mine is generally considered a safe one; roof tolerably good and no explosive gas generated. Ventilation is produced by a natural draft, assisted by the steam exhaust, from a large steam pump which is placed at the foot of the air shaft. The ventilation is not satisfactory, and a fan has been promised which may be built in 1873. Present ventilation.—Amount of air at face of mine, 19,800; amount at outlet, 23,200 cubic feet per minute.

Number of persons employed, 140.

C. Sharar, general superintendent, (acting;) M. Shonk, mining boss.

No. 5 shaft.—This colliery is located between No. 4 shaft and Plymouth. It is sunk through the Cooper and into the Bennet vein a depth of 235 feet. This colliery has been idle for some time this year while changing their hoisting drum and putting on another new brake, which also has been condemned since. This is the third brake that has been condemned at this one place within two years, and a fourth is now being constructed.

A brake should be convenient to apply and easily handled, either to be put on or taken off, so that the engineer becomes familiarized with the use of the same as he does with his engine handle.

Condition and ventilation.—This mine is a very safe one; has good roof and no explosive gas generated. The hoisting arrangements and safety appliances are of the best in use for safety, except the brake. Ventilation is produced by a fan 13 feet in diameter. Amount of air at face of mine, 24,000 cubic feet; amount at outlet, 39,200 cubic feet per minute. Number of persons employed, 102.

C. Sharar, general superintendent, (acting;) C. Shonk, mining boss.

Paxton Coal Company's Mines.

These mines are located near Shickshinny, several hundred feet above the river. They consist of three drifts on the Red Ash vein. These mines have been idle a great deal of the time during the year 1872.

Condition.—These mines are tolerably safe; have good roof and they do not generate any fire-damp. Ventilation is produced by the use of small grates instead of furnaces. Amount of air at face of mine, 3,000 cubic feet; amount at outlet, 6,000 cubic feet per minute; number of persons employed inside, 79.

J. H. Harman, general superintendent; John Thomas, mining boss.

Roberts, Albrighton & Co.'s Mine.

Chauncey mine.—This colliery is located west of and adjoining the Avondale workings. It is a tunnel opening, but has a slope from the far end to reach the coal in the Red Ash vein.

Condition.—This is an old mine which has been worked, like many others in times past, without any regard to system or economy of mining. The vein is from 20 to 25 feet in thickness. It has some bad roof but does not generate fire-damp.

Ventilation is produced by connecting their air current to a fan in the adjoining colliery west of them. It has not been satisfactory up to this time, and I am not able to see any great improvement likely to be made in the near future. In the past many good promises have been made in regard to improvements and but few of them fulfilled. Amount of air at inlet, 17,000 cubic feet; amount at face of mine, 4,800 cubic feet per minute; number of persons employed inside, 100. John Albrighton, mining boss.

Susquehanna Coal Company's Mines.

These mines are located at East and West Nanticoke, and consist of three drifts and two slopes at East Nanticoke and one slope and one tunnel at West Nanticoke.

East Nanticoke.—Nos. 1 and 2 drifts are being worked loose to each other, and are ventilated by the same furnace. This mine is considered tolerably safe; has good roof and does not generate explosive gas.

Ventilation.—This has always been at a low figure in this mine and was not much different when I last visited it, although a promise had been made for some improvements. Amount of air at face of mine, 8,000 cubic feet; amount at outlet, 18,500 cubic feet per minute.

Joseph Stickney, general superintendent; O. Richards, mining superintendent; George T. Morgan, assistant mining superintendent; David Evans, mining boss.

Slope No. 1.—This slope is adjoining the No. 1 drift below water level and on the same vein.

Condition.—The roof is generally very good, and no explosive gasses being generated, the mine is considered a safe one.

Ventilation is produced by a fan 15 feet in diameter, which ventilates the whole mine tolerably good since last winter, when the return air-ways were enlarged, which increased the aggregate quantity of air from 13,000 to 35,000 cubic feet per minute. There are two lifts being worked, each being ventilated separately. Tim. Downing, mining boss.

Honey Pot drift.—This drift is located a little south of No. 2 drift; has about 30 places working. Ventilated by a furnace. Amount of air at outlet, 8,000 cubic feet. S. Wilson, mining boss.

No. 2 *slope.*—This mine is located a short distance west of the town of Nanticoke. The vein which the slope is sunk upon is claimed by some to be one of the divided beds of the Baltimore vein. There is a tunnel from foot of slope southward to the overlying vein, which they also work through this tunnel and slope. The top vein generates a small quantity of fire-damp. Both the veins are being ventilated by a fan 15 feet in diameter; the two currents being connected at fan. The vanes of this fan are different in shape to those used in other fans in this district of a similar make, such as the Avondale fan, &c. The difference is this: the vane is contracted at the point. It is claimed by some that such fans are superior to others, but I have not seen any data either for or against this argument.

Condition.—The roof is rather of a dangerous character. It is of a melting nature, hence very treacherous, in both veins; the top vein also generates a small quantity of fire-damp.

Ventilation is tolerably good in both veins. Amount of air at face of mine, 45,500 cubic feet; amount at outlet, 62,800 cubic feet per minute.

Geo. F. Faulkmyer, mining boss.

West Nanticoke.—These mines comprise what was formerly known as the Harvey and the Grand Tunnel mines. The Harvey mine has been almost entirely abandoned, and a slope has been sunk which has three lifts, and two of them are connected with the old workings of the M'Farland shaft. The head of

the slope has been placed high enough so as to run the coal out level with the trestling leading to the top of the new breaker.

The old Harvey breaker was torn down, and in its stead there has been built one of the largest coal breakers in this district. It has about 800,000 feet of lumber in it, which breaks the coal from this and the Grand Tunnel mine. The vein being worked is the Red Ash, or as often called the "Grand Tunnel bed."

Condition.—The general condition of this mine is considered safe.

Ventilation is produced by a fan 15 feet in diameter, placed in the old M'Farland shaft, and is large enough to exhaust a large quantity of air if properly arranged. The lower lift just opening has not a second opening, but it is being driven to connect with No. 2 lift. Amount of air at inlet 18,500 cubic feet per minute. Number of persons employed 40. John Parry, mining boss.

Grand Tunnel mine.—This mine is a tunnel, and adjoining the Harvey mine on the west, and bounded on the east by the Chauncey mine, and working the same vein. The old workings of this mine have been nearly all abandoned. A few places are being worked near the crop of the vein in the Harvey old workings, the coal from which is brought to the surface through this tunnel. Besides the above, a new work has been opened by driving a tunnel to a portion of the vein cut off by a fault north of the old workings.

Condition and ventilation.—The roof of the vein when in its regular place is very good but it is not so here, hence no dependence can be placed on the roof, the whole being more or less confused.

Ventilation is produced in summer by connecting to the M'Farland shaft's fan and in winter by natural draught, (the mine being located high on the mountain side,) neither of which is satisfactory, and a fan or furnace is promised to be erected in the spring of 1873.

The coal from this mine is now being taken to the new breaker at the Harvey mine, as the old breaker that was here was abandoned at the time of the boiler explosion in 1871.

Jos. Stickney, general superintendent; O. Richards, mining superintendent; Geo. T. Morgan, assistant mining superintendent; John Parry, mining boss.

Waterman, Beaver & Co.'s Mines.

These mines are located just north of Kingston and consist of one shaft hoisting coal, and one shaft now being sunk which is down about 50 feet; also a slope sunk on the out-cropping of the vein located about four-fifths of a mile north of the main shaft. It is also the second opening to the main shaft. The main shaft is 385 feet deep in which two veins are being worked, supposed to be the Baltimore vein divided.

Condition and ventilation.—These mines are usually considered very safe, having a good roof in both veins and do not generate explosive gases. Ventilation is produced by a fan 12 feet in diameter, put up this year. It is similar in construction to the Avondale fan. This fan has to ventilate both veins, but it is too small to do so in a satisfactory manner, especially during the hot weather. It is located on much higher ground than the top of the downcast, besides being placed at so great a distance away from the working part of the mine.

The air is divided east and west; also one split for the top vein. The top vein workings had to be stopped for a time in the forepart of last summer for want of better ventilation, during which time there were several improvements made, such as replacing the old wooden stoppings with stone and mortar ones, and making many new cross-cuts between the different parts that were in need of such, besides making a new communication through the rock between the two veins for a new and shorter return air-way.

There are two parallel places being driven from the western end of the old workings in the lower vein to connect with the new shaft, now being sunk, and this will form a second opening for said new shaft. I am compelled to state that there has been but very little effort made towards the proper ventilation of this mine until very recently, caused either from the want of knowledge of the parties in charge or otherwise, by disregarding the plain requirements of the ventilation law, together with the many complaints and suggestions of the mine inspector. Amount of air at face of mine, 18,900 cubic feet per minute; amount at outlet, 28,300 cubic feet per minute; number of persons employed, 59. Daniel Edwards, Esq., general superintendent; M. Rosser, mining boss.

No. 1 *slope.*—This slope, as stated before, is located at the northern end of the second opening to the old shaft, and is on the same vein; it is now ready to hoist coal, having its machinery, &c., in working order; some coal is being hoisted at present for local sales; but the new breaker and the road leading thereto are not quite ready.

No. 2 *shaft.*—This shaft is located north-west of the old shaft some distance, and is intended to work the coal from the north and west as far as their jurisdiction goes. The work is being done by direction of the general superintendent, Daniel Edwards, Esq.

Wilkesbarre and Seneca Lake Coal Company's Mines.

This colliery is located on the plank road near the Hillman old colliery. The same vein is being worked as formerly was worked by Hillman & Son, hence called the Hillman vein. Besides the above, there has been another vein tunneled into, but not much coal worked out from it as yet.

The surface opening is a slope, which is sunk about 600 feet below the old Hillman (or water level) gangway. One lift is just opened out at bottom of slope. The other lift 300 feet below the water level is the one in regard to which we had so much law in regard to the second opening. This matter having been well ventilated through the papers from time to time, I do not deem it necessary to go into the details in this report, but suffice it to say, that the action of the inspector was sustained by the decision of the county court, which has since been affirmed by the Supreme Court.

That part of the mine just referred to has been idle for many months this year, but is now being worked in compliance with the requirements of the ventilation law. There is considerable gas generated in that part of the mine, but with ordinary care on the part of the mine boss and the employees, there should be no serious difficulty in ventilating the place.

There is some work being done on the old water level lift. It is an old working, and is difficult to get any extra current to circulate the face of the mine. There is a small furnace being used at present to ventilate the same.

Ventilation is produced for the lower working by a fan 12 feet diameter. Amount of air at face of mine 10,550 cubic feet per minute; amount at outlet 32,000 cubic feet.

Wm. B. Maffet, general superintendent; J. Teasdale, mining boss.

Wilkesbarre Coal and Iron Company's Mines.

The mines operated by this company are located some on the north and others south of the Susquehanna river, and consist of 4 shafts, 7 slopes, 1 tunnel and 1 drift producing coal, exclusive of two drifts abandoned, Hollenback No. 1 and the Hartford water level drifts. In addition to the above, there are 4 shafts, 3 tunnels and 2 slopes now being opened or sunk.

No. — *tunnel.*—This is a new opening. It is located at Espy, a small village between Warrior Run and Wanamie. It has been driven southward into the base of the mountain about 1,500 feet. The intention is to reach the Red Ash vein. It is discontinued for the present.

No. — *Slope.*—This slope also is located at Espy. It is a new one; just being sunk, and is down at present about 200 feet. It is opened on the cropping of a vein just outside of the tunnel entrance. No breaker has keen built at this place yet.

Geo. Parrish, general superintendent.

No. 9 *shaft.*—This shaft is located within the borough of Sugar Notch. It is sunk into a small vein called the five feet, from which a tunnel has been driven into what is generally called the Ross vein here.

This has been rather a troublesome mine to ventilate, on account of having met with so many large rock faults. Besides that, their fan is placed at so great a distance away from the working that much of its power is expended by friction outside of the working part of the mine. Notwithstanding this, the mining boss,

Mr. Robt. Looney, and his assistant, have made better use of the quantity of air they have than two-thirds of the mining bosses in this district, *i. e.*, the air is better kept up to the face of the workings and thereby makes it safer and healthier for their men. Very few persons have been injured there in any way, and especially by burning, during the last year.

Machinery.—There has been much trouble in having the safety appliances satisfactory, such as safety catches, covers on carriages and an adequate brake on the hoisting drum. There have been three brakes condemned at this place during the last two years; the fourth is on the drum at present and gives good satisfaction; it is a compound lever brake without any dead weight attached. The superintendent of this company has decided to put on in future a different kind of safety catches from the ones in use at present; they are to be similar to the kind in use at Avondale shaft.

Robert Looney, mining boss.

Red Ash tunnel.—This is a small opening or mine located south of the borough of High, on the mountain side. The tunnel has been driven into the Red Ash vein. There are two lifts being worked in this mine when in operation, but it has not been worked much during this year.

Condition and ventilation.—This mine may be considered a safe one. It has good rock roof and no explosive gases are evolved. The ventilation is produced by the use of a furnace which is located above the workings in the outlet, the results depending much upon the temperature of the atmosphere outside. This mine has been worked by contract. Mr. J. Lovel, contractor.

Robt. Looney, mining boss.

No. 10 slope.—This mine is located a short distance north of the No. 9 shaft at Sugar Notch. It is a new colliery, the slope now being sunk about 600 feet and not yet graded, but will be ready to commence opening gangways and drive for a second opening early next spring.

Gee. H. Parrish, general superintendent; Thomas Cassedy, assistant superintendent; Adam Harkness, mining boss.

Hartford Slope No. 1.—This slope is located near Ashland borough and sunk on the Baltimore vein. The workings on the same lift at the slope have been worked out and another slope has been sunk on the same vein, commencing at a point several hundred feet east of the foot of No. 1. The coals from this slope are being hoisted to the surface through slope No. 1. There is also a tunnel driven from the Baltimore vein into the Ross vein, and one lift is being worked there, and its coals are taken out through said tunnel and hoisted through No. 1 slope.

Condition and ventilation.—These parts of the mine are considered tolerably safe. Ventilation is produced by a fan 15 feet in diameter, in the Ross vein, and by natural means, with the assistance of the heat and steam from boilers in No. 3 slope, on the Baltimore vein. Number of persons employed in No. 8 slope 36. John Clinton, mining boss.

No. 2 slope.—This slope is located south of No. 1, but is started from the inside on the water level gangway of the old tunnel, through which its coals are brought to the surface; it is sunk on the Ross vein, and through it the coals from one lift is being hoisted; the lift below being worked through the tunnel from the Baltimore vein.

Condition and ventilation.—These workings are tolerably safe. The roof is good, but there are small quantities of fire-damp generated in the lower lifts in both veins. Ventilation is produced in the Ross vein, both lifts, by a fan 15 feet in diameter. The air is divided east and west at the lower tunnel. This is then coursed through both lifts, and as a matter of course the air cannot but be very foul before it traverses the whole route, an unavoidable result where the system of coursing the air for so long a distance is adopted. It is an old working, and badly arranged for a systematic ventilation of the same. Geo. H. Parrish, Esq., general superintendent; Mr. William Tiffeny, assistant superintendent in charge; Mr. John T. Griffith, mining superintendent; Thomas Harkness, mining boss.

Slope No. 8.—This slope is located east of and adjoining the Hartford mines. It is sunk on the Baltimore vein. This colliery is nearly worked out, there being but some few places at work robbing pillars, &c., preparatory to abandonment. Ventilation is produced by a fan 15 feet in diameter. Number of persons employed inside, 20. Samuel Marsdon, contractor, and other officials same as over the Hartford mines.

Empire No. 2 shaft.—This shaft is located south of Wilkesbarre and near the Empire mines. It is 280 feet deep and sunk into the Red-Ash vein. This shaft has not been worked any since July, 1870, when it was stopped by the inspector,

not having a second opening. The company began to drive for a second opening, but the driving was suspended and has remained idle ever since.

Slope No. 2.—This slope is located close to the No. 2 shaft. It is sunk on the Baltimore vein. Its upper workings having been worked out, it was continued down and connected to the west side of the Empire shaft workings. The coals from the west gangway workings are being hoisted through this slope. Besides this, a slope has been sunk still deeper, which is located a short distance west of the foot of No. 2 slope, and is called No. 4 slope. The coals from this No. 4 slope are also hoisted through No. 2 slope to the surface.

Condition.—This mine cannot be called a very safe one. It has tolerably good roof in most parts, but the vein is thick and has various pitches, *i. e.*, in different parts of the mine. A number of persons have been injured by falls of coal, &c., and a good many by being burnt by explosions of fire-damp. Some of them have been crippled for life, others having lost their lives, and caused in divers ways—some from their own carelessness, others from ignorance of the elements they had to contend with.

The officers in charge have generally exercised a great deal of care in the management of this mine, and in order to try and lessen the number of accidents from explosions of fire-damp they employed a fire-boss for night as well as for day. A set of special rules have been drawn up and are being put into practice, which work well.

Ventilation.—The ventilation is produced by a fan 15 feet in diameter, which is placed inside of the mine and discharges in the old workings. Amount of air at face of mine, 22,000 cubic feet; amount at outlet, 29,000 cubic feet per minute. Number of persons employed inside, 159.

George H. Parrish, general superintendent; John T. Griffith, mining superintendent; Christ Konrad, mining boss.

Empire Shaft Workings.

This shaft is located a short distance south of the city of Wilkesbarre. It is 320 feet deep and sunk to the Hillman (or 7 feet) vein. The workings in this vein consist of about 30 places and were lying idle from July, 1871, until last spring, having been stopped for want of sufficient ventilation, when there was a ten feet diameter fan put up to ventilate it, and this small fan was put up against the remonstrances of the Inspector, as it was very evident that it would be too small to produce the circulation required. It was started and gave as good results as could be expected, but not as much as was claimed it would give, by some of the officers of the company, and after having been in operation but six months, it has been replaced by a fan fifteen feet in diameter, and which gives very good satisfaction. The vein worked is a small one in comparison to the Baltimore vein. It is hard to mine and has some few wet places, the whole requiring a great deal of powder to loosen the coal and in consequence makes much powder smoke, which requires a strong current of fresh air to carry the same away. This vein also generates a small quantity of fire-damp.

Amount of air at inlet in 1870, 3,000 cubic feet per minute; amount of air at inlet in year 1872, as per report, 29,600 cubic feet per minute; amount at face of mine, 9,200 cubic feet per minute. Number of persons employed inside, 84.

A short distance south-west of the shaft a tunnel has been driven into the Baltimore vein, and on the east side of which No. 5 (an inside) slope has been sunk where two lifts are being worked and opening a third at present.

Condition.—This part of the mine has good roof and does not give off a very great quantity of explosive gas. Ventilation is produced by the action of the fire under the steam boilers, together with the assistance of the steam exhaust from the hoisting engine. Amount of air at inlet, 27,900 cubic feet; amount at face of mine, 9,050 cubic feet per minute. Number of persons employed, 132.

Safety appliances and machinery at shaft.—These are all of the best kind in use in the district except the safety catches on the hoisting carriages, which are soon to be changed. There has been a large bull pump put up in 1871, of 500 horse power. This year a pair of first motion engines have been put up to hoist coal, which were built by Snyder, Pottsville. The engine, its drum, brake, &c., are of the same make as those put up at the Prospect shaft by the Luzerne coal and iron company, previously described, of a smaller size. Too much praise cannot be

given to the officers of the company in regard to the manner in which they endeavor to protect their employees while ascending and descending this shaft. They have the required gates on the shaft head. Besides that they keep a man there from the time the first persons descend in the morning until the same are all hoisted in the evening, and not more than ten persons are ever allowed to descend or ascend at a time. Each person must procure a ticket before getting on the carriage, if there are but ten. There have been some special rules drawn up at this mine in regard to places generating explosive gases which are much needed to become general through the district in addition to these few.

George H. Parrish, general superintendent; John T. Griffith, mining superintendent; Lewis S. Jones, mining boss.

Slope No. 7.—This slope is located west and adjoinifg the No. 4 slope and sunk down from the old Stanton slope through the western end of the No. 4 gangway. It is at present about seven feet long and below the No. 4 workings, and is intended to connect with the Audenreid shaft for a second opening for the same. There are over 2,000 feet of rope at present on the hoisting drum.

This slope has all the appearance of becoming an extraordinary fiery place. It is being driven by contract by Messrs. John Haycoke, James H. Williams and Morgan R. Morgans. J. T. Griffith, mining superintendent.

Hollanback, No. 3, slope.—This slope is located within the south-east corner of the city limits, opened on the Hillman vein, and is 12 feet deep. This slope has not been worked for several months, except preparing to sink a new lift and further preparing a new road to take the coal from there in future to a new breaker which is being built east of the slope and near the Diamond shaft.

Condition.—This vein is usually very safe; has good bone roof and can easily be timbered, and does not generate much fire-damp. Ventilation is produced by a fan 15 feet in diameter. Amount of air at inlet, 30,000 cubic feet; at face of mines, 18,000 cubic feet per minute; number of persons employed, 60. William Dickie, mining boss.

Hollanback, No. 2, slope.—This slope is located a short distance south-east of the No. 3, but it is opened on the Baltimore vein. It has another slope inside which supplies it with coal from the lower workings.

Condition.—This mine is a safe one; has good roof generally and does not evolve any fire-damp as yet, but no telling how soon it may be met with.

Ventilation is produced by a fan 15 feet in diameter, which is located on the surface near the head of the slope, and has to draw the air through an air-way made along the main slope through the old workings, and being a large vein and an occasional crush on it, it is hard to keep in good order; however, the ventilation is better than it was prior to the fan being put up, but the mine cannot be called a well ventilated mine up to the present time. Usually it has considerable powder smoke along the faces of the chambers. The parties in charge are very sparing in driving cross-cuts from one place to another, and not enough of its air forced through the faces of the chambers, caused by too few cross-cuts and check doors on main gangway. Amount of air at out-let, 30,675 cubic feet; at face of mine, 20,716 cubic feet per minute; number of persons employed inside, 104. M. B. Williams, mining boss.

Diamond shaft.—This shaft is located a short distance east of the city limits, is 300 feet deep, and sunk into the Baltimore vein. This mine has a good roof, with the exception of a few places were the vein pitches rapidly and the coal very full of slips; but has considerable gas in some parts of the mine. It is an extensive mine, has an inside slope, sunk down west of the shaft towards the Hollanback new shaft; a new lift is being opened at the distance of 300 feet below the old gangway; besides this the slope is being continued downward. This slope has symptoms of considerable gas in the coal.

Ventilation is produced by a natural draught, assisted by the heat from steam boilers and steam exhaust from hoisting engines placed inside to hoist from inside slope. The amount of air is sufficient in this mine to do the work, but it is coursed in one single current though the whole mine, which causes a great deal of foul air and smoke to linger along the chambers, the vein being about 18 or 20 feet thick in some parts, and the men having to wheel the coal for long distances, this smoke makes it both unpleasant and unhealthy and in some instances unsafe. In other particulars this is well provided with the necessary safety arrangements, and first class doors, and as many of them, such as check doors, as can be of any advantage. The air-ways are large, and the stoppings are being built at present with stone and mortar instead of wooden ones as heretofore. Amount of air at inlet 19,360 cubic feet, at face of mine 15,600 cubic feet per minute; number of persons employed inside, 220. Leopole Stutz, mining boss.

Audenreid shaft.—This shaft is located south-west of the city. It is just being sunk, is down at present over 700 feet, and will probably reach the Baltimore vein at about 800 feet from surface. There are all indications of this becoming a fiery mine when once opened; it will have its second opening ready by the time it is down. Rendrick Bros., contractors; John T. Griffith, mining superintendent.

Hollanback shaft.—This is a new shaft located near the S. R. R., and within the city limits. It is down at present about 350 feet, it is to go to the Baltimore vein. There are indications of large quantities of gas in this shaft also. The second opening to it will be made from the Hollanback, No. 8, in the Hillman vein, and from the Diamond shaft for the Baltimore vein. Murry & Son, contractors; John J. Griffith, mining superintendent.

South Wilkesbarre shaft.—This is a new shaft, located also within the city limits. It has not been worked of late; only preparing to start, having had its head house, engine house, &c., burnt down a short time ago. It is down now about 100 feet, and is intended to reach the Baltimore vein. Smyth & Son, contractors; John T. Griffith, mining boss.

Lance shaft.—This colliery is located near Plymouth borough. It was sunk last year from the Lance vein to the Bennet vein. Gangways, air-ways, &c., have been started in the Cooper bed or the top bed of the Baltimore vein. There is to be a second opening made between this and the Dodson shaft, by driving gangways from both sides to meet. The old 8 feet fan has been replaced by a 15 feet fan. They are changing some of the hoisting machinery and remodeling the breaker, and expect to be ready to ship coal in 1873.

The plan upon which the bottom and turnouts of this shaft is being opened out, promises to be an improvement upon the old style of opening out around the bottom and tunnels of mines in the past, if properly carried out, with some slight changes as suggested by the inspector, it will give a fair chance to ventilate the mine properly by having double doors, so that the air currents on either side need not be cut from one end of the week to the other, besides having hundreds of feet on either side of the shaft without a door, hence free to pass from the obstructions of so many doors close to foot of shaft. John T. Griffith, mining superintendent: Wm. Smyth, assistant; Geo. H. Parrish, general superintendent; F. Tiffeney, assistant.

Dodson shaft.—This shaft is located in Plymouth borough and is 280 feet deep. It is sunk into the Bennet vein, in which vein the work has been opened out.

There has been considerable trouble experienced in opening this mine. A heavy stream of water was cut in the west gangway, which compelled the abandonment of the same, having cut the same twice in this same vein, and a similar one in the overlying vein, from which cause it was found necessary to abandon the west gangways in each vein for the present. It was my opinion from the outside indication that it was doubtful as regards the safety of opening a gangway westward on the Cooper vein without first ascertaining how much rock covering it had, as it might be that the rock roof of the same could be replaced by a sand bed which, if struck, would let in the water from the river bed and drown out the mine in a short time, and in all probability sacrifice many lives. Accordingly, I called the attention of the company's officials to the matter and requested them to find out the thickness of rock overlying the vein at this point. When the time arrived for them to start the gangways westward, they did not pay any attention to the matter of how much rock roof they had, but pushed on their gangways. They did not go far, however, before they struck a water seam and which caused them to abandon the same. This shows how much unnecessary risk of loosing many lives and destroying much valuable property is often run for the sake of saving a few paltry dollars and this even after being cautioned of the danger, &c. Otherwise the mine is tolerably safe, considering that there is some explosive gas generated and that the Cooper vein has some very dangerous roof, but it being very well timbered.

Ventilation is produced by a fan 15 feet in diameter, and is tolerably good at present, having had several important improvements made this year in the way of making new air bridges of large size, and splitting the air into several currents; besides this they have the stone and mortar system of building their stoppings, instead of the wooden ones, as heretofore, and which, on the whole, makes it a well ventilated mine.

All the safety appliances are in good order, such as bridle-chains, safety-catches, speaking-tube, gates at head of shaft and an adequate brake on the hoisting drum; besides, there is a convenient way to travel up and down the second opening shaft by a first-class set of ladders. Amount of air at inlet,

25,500 cubic feet; amount at face of mine, 28,300 cubic feet per minute. Number of persons employed inside, 80.

Daniel Reese, mining boss; Jno. T. Griffith, mining superintendent; Wm. Smyth, assistant; Geo. H. Parrish, general superintendent; F. Tiffeney, assistant.

Gaylord slope.—This slope is located in Plymouth borough. It is sunk across the measures and has its bottom opened out on the Cooper bed and has a tunnel into the Bennet vein. The body of its present workings are in the Bennet seam, the Cooper not proving as good as it does in other localities. On the western end of the mine the two seams, Bennet and Cooper, are united into one large vein, not having more than six inches of slate between the two beds.

Condition.—This mine is a very safe one, has good roof and does not generate any fire-damp. Many important improvements have been made in this mine during the time that this company has had possession of it, such as the putting up of a fan 15 feet in diameter; the laying of new roads; building of stone and mortar stoppings instead of wooden ones, as heretofore; new air-ways, cut through the solid rock, and a new set of steps put in alongside the slope for a traveling road, with a row of ten-inch timber thickly set between the traveling and the hoisting road, and planked on the side nearest the car with two-inch plank; this makes a tolerably good traveling road, about as good as can be made when placed in the slope as this is—a very unfit place to have a traveling road if it can be avoided; but when a slope is sunk through rock it is difficult to overcome this matter.

Ventilation is tolerably good. Amount of air at inlet, 35,200 cubic feet per minute; amount at face of mine, 32,600 cubic feet per minute; number of persons employed inside, 115. George Pickton, mining boss; John T. Griffith, mining superintendent; William Smyth, assistant; George H. Parrish, general superintendent; F. Tiffeney, assistant.

New shaft.—This is a new shaft just being sunk. It is down about 50 feet, and ready to put in the permanent timber. Dimensions, 46×13 feet. It is intended to reach the Red-Ash vein with this shaft at a depth of 50 feet. Officers in charge, Smyth, Griffith, Tiffeney and George Parrish.

The following new breakers are being built by the Wilkesbarre coal and iron company: One at Sugar Notch, which is almost ready for operation at present; one at the Diamond shaft, which will be ready early next spring. Besides the above, the Lance breaker, now being remodelled, will be ready for operation next spring.

LOCAL OPERATIONS.

There are some nine of these that I have a record of; most of them, however, work only during the winter months.

Messrs. Davis & Co.'s Colliery.

This mine is located a short distance north of the West Pittston old shaft. It is a small opening just being opened on the water level to supply a local trade. Employs 14 persons inside and 9 outside. Mr. Joseph Davis, mine boss.

Payne Petybone's Drift.

This is a small drift located on the back north of the town of Wyoming. It is worked only during winter to supply a local trade. Wm. Jones, mining boss.

Moss & Pollock's Drift and Slope.

These mines are located a short distance west of the Petybone drift, on the back road, and work only during the winter months to supply a local trade.

L. Myers' Coal Bed.

This is a small water level drift, adjoining that of Pollock & Co.'s. It has not been worked any during 1872.

Stark & Sibrel's Drift.

This is a small drift located about a mile west of the Maltby shaft, on the back road between Pittston and Kingston, and is worked only during winter to supply a local trade.

George Rice's Drift.

This drift is located north of the Hutcheson colliery, opened on the Red Ash vein. It is being worked only to supply a local trade.

J. D. & H. M. Hoyt's Drift.

This drift is located north of the Waterman and Beaver mines. It is only worked to supply a local trade.

Goodwin's Drift.

This small opening is located just north of the Waterman and Beaver new slope. It has not been worked any during 1872.

Warden's Drift.

This drift is located within a few hundred feet of the Goodwin drift. It is only worked to supply a local trade during the winter months.

Improvements.

The following improvements are in progress in the district: There are 10 new shafts being sunk, besides one that was begun in 1870 that has not been worked any during 1872. There are five new slopes and four new tunnels. There are seven new breakers that have never broke any coal that will be ready to do so early in 1873, and one that has been remodeled, &c., which broke no coal during 1872, will be ready early in 1873.

Fans.

There have been twelve new fans built and put into operation during this year and one now under construction at Mill Creek mines, as follows:

No. 1.—Wanamie, No. 2 slope fan, April..... 15 feet in diameter.
No. 2.—Nottingham shaft fan, May..... 15 feet in diameter.
No. 3.—Gaylord slope fan, May..... 15 feet in diameter.
No. 4.—Waterman & Beaver's fan, July..... 12 feet in diameter.
No. 5.—Hutcheson & Co.'s fan, July..... 15 feet in diameter.
No. 6.—Conyngham shaft fan, July..... 20 feet in diameter.

No. 7.—Empire shaft, Hillman vein fan, July	8 feet in diameter.
No. 8.—Wanamie, No. 3 slope fan, July	15 feet in diameter.
No. 9.—Henry shaft fan, August	18 feet in diameter.
No. 10.—Prospect shaft fan, September	20 feet in diameter.
No. 11.—Lance shaft fan, October	15 feet in diameter.
No. 12.—Empire, Hillman vein, replaced November	15 feet in diameter.

Coal Production of the District.

The quantity sent to market during 1871, was	3,000,000 tons.
The quantity sent to market during 1872, was	3,250,000 tons.
Increase during 1872	250,000 tons.

Number of Persons Employed in the District.

Employed in the year 1871, were	9,870
Employed in the year 1872, were	9,807
Decrease during 1872	63
The above number of persons being divided as follows:	
Inside men	5,326
Inside boys	949
Total inside	6,275
Outside men	1,807
Outside boys	1,725
Total outside	3,532
Total number of men	7,133
Total number of boys	2,674
Total number of both	9,807
Total number of actual miners employed	2,450

The above exhibits that there were sent to market 331.4 tons of coal to each person employed at the mines, and 1,326.5 to each miner employed in 1872; hence, if we divide the amount produced during the whole year by 313, the number of working days in one year, it will=1.0575 tons per day per person, and divide 1,326 again by the number of actual miners employed, or who call themselves such= 4.236 tons per day to each miner. Now, then, it is well known that much time is always being lost each year about the mines from various causes, and the average number of days worked in this district during 1872 were about 220; therefore, to ascertain the amount of coal produced per person employed, the amount should be divided by 220 days, instead of 313, which=1.5 tons per day, and for each miner employed=about 6 tons per day for the year 1872.

Casualties.

There have been 40 lives lost in the district during the year, causing 21 widows and 61 orphans; besides the above, 121 persons were seriously injured, many of whom will be crippled for life; of the above number of deaths, 37 killed, or died from injuries received inside the mines, and 3 were killed, or died from injuries received outside the mines.

In 1871 the ratio of deaths in and around the mines, was 1 death for every 56,000 tons of coal sent to market, and 1 serious accident to every 32,000 tons. In 1872 the ratio is one death to every 81,250 tons of coal sent to market, and 1 serious injury to each 26,859 tons sent to market.

Further, the death rate of persons employed is as follows:

In 1871 number of persons employed inside, 6,380; number of lives lost, 47	.73 per cent.
In 1871 number of persons employed outside, 3,490; number of lives lost, 6	.17 per cent.
Total number of persons employed inside and outside, 9,870: total number of deaths, 53	.53 per cent.
In 1872 number of persons employed inside, 6,275; number of lives lost, 37	.59 per cent.
In 1872 number of persons employed outside, 3,532; number of lives lost, 3	.84 per cent.
Total number of persons employed inside and outside, 9,807; total number of deaths, 40	.4 per cent.
Total number of persons employed in 1871 were 9,870; death rate	.53 per cent.
Total number of persons employed in 1872 were 9,807; death rate	.4 per cent.
Decrease in 1872 was 63.; decrease	.1 per cent.

In regard to the above list of casualties, I would state that a large percentage of the same have occurred through the carelessness and ignorance of the victims themselves, in not obeying the rules or orders given them by their bosses, and often from not knowing the result or consequence of their disobedience until too late to remedy the same. Again, a heavy percentage of the list should be attributed to the carelessness and unfitness of mining bosses; many of them acting upon the principle of making money for their employers, though neglecting the safety of persons under their care, the lives and limbs of employees being of secondary consideration.

I am of opinion that a mining boss should be a person of much experience in mining, should be possessed of at least an ordinary education, and should be a man of energy and much executive ability; without these qualities he cannot succeed in putting his plans into operation in an effective manner.

There is one reason in particular why we have so many examples in the positions referred to, and that is this: The companies take pride in having a large number of general superintendents and their assistants, mining foremen and their assistants, all of whom draw large salaries; but the actual mining boss can be a low salaried officer, as there are always plenty of applicants for such positions at low rates; again he must take all the orders given him from those higher in rank, and execute them, no matter how wrong they may be; if he puts them in practice, and they do not answer their purpose, he is discharged and another cheap boss employed. The competent men look on and are too much discouraged and disgusted to try for a position, as they know they could not stand such abuse from any source. In this way very little inducement is held out to a good class of men to become mining bosses.

Machinery.

The number of steam engines, boilers, &c., in use in the district, are about the same as when last reported. In regard to steam boilers, I must say that it is a wonder that we do not have more accidents from explosions, as the present system of inspection is not adequate. It seems to me that there is as much need of a boiler inspector in Luzerne and Carbon counties, as there is in the counties of Schuylkill and Columbia, where they have such an officer already.

Inquests.—I would suggest that if any change be made in the mining law, that the manner of holding inquests be uniform. It is very unsatisfactory in this county at present; no inquests are being held unless the coroner or justice of the peace sees fit to do so, and that is seldom. The reason of which is, some difficulty exists in regard to pay for holding the same, on account of a county law passed in 1866. This should be remedied. It is true that the inspector has power to hold an investigation to learn the cause of the accident for the purpose of making a record of the same, but in many instances this is not satisfactory to the inspector, or to the parties interested.

Prosecutions.

The case of the Commonwealth, upon the relation of T. M. Williams, against "the Wilkesbarre and Seneca Lake coal company," mentioned in last years report, was pushed the present year to successful issue. The prayer of the bill was for an injunction to restrain the defendants from working a lower lift in a slope,

to which there was but one outlet. The defendants contending that two openings communicating with upper lifts was virtual compliance with the words of the act, which only requires them to be in communication with every seam or stratum of coal for the time being at work. The court below, Hon. G. M. Harding, president judge, did not so view the law, and upon appeal to the Supreme Court, he was amply sustained and an injunction granted.

In addition to the above, two persons, one a mining boss and the other a miner, were prosecuted for riding upon a loaded car in the Gaylor slope, near Plymouth.

The following is the decision of the Hon. G. M. Harding, in relation to working of second lifts:

Commonwealth *ex rel.* T. M. Williams, Inspector of Mines for the Middle district of Luzerne and Carbon counties,
vs.
The Wilkesbarre and Seneca Lake coal company and William R. Maffet, &c.

In Equity.
No. 22, October Term, 1871.

This is a proceeding under an act of the General Assembly of the Commonwealth, entitled "An Act providing for the health and safety of persons employed in coal mines," approved March 3, 1871.

The first paragraph of the bill, after setting out that the relator is the inspector of mines for the Middle district of Luzerne and Carbon counties, and that the defendants are the lessees and occupiers of a coal mine and colliery, commonly known as the colliery of the Wilkesbarre and Seneca Lake coal company, situate in Plains township, Luzerne county, and within the jurisdiction of this court, charges, substantially, that the said coal mine or colliery is worked through a single slope, by the side of which there is a small air-way only, and that there are not two outlets in communication with the seam or *stratum* of coal thus worked, "separated by natural *strata* of not less than one hundred and fifty feet in breadth," whereby distinct means of ingress and egress are always available to the persons employed in the said mine or colliery.

The second paragraph of said bill, as now amended, charges that the defendants have sunk a slope from old workings in a certain vein called the "Hillman" vein, to the depth of three hundred feet and upwards, along and following the pitch of said vein, and have driven gangways from the foot of said slope, thereby opening what is practically a new mine, and that they are engaged in working the same, without having two outlets connected therewith, for the safe and convenient ingress and egress of persons employed therein; and further, that the defendants employ a large number of persons, "to wit: forty persons at the same time," and permit them to be in the said mine, where they are daily engaged in mining, raising and shipping coal, and in carrying on the usual and ordinary business of said mine, in contravention of the act of the General Assembly before referred to.

The bill concludes with a prayer that an injunction may issue from this court to restrain the said defendants, their agents, servants, workmen, and all other persons deriving authority from them, from working the said mine or colliery, until compliance shall have been made with the provisions of the act of Assembly aforesaid.

We had entertained the hope that the act of 3d March, 1870, better known as the "Mine ventilation law," had been so fully passed upon by this court in Com. *ex rel.* v. Bonnell, *et al.*, reported at length in Leg. Int. vol. 28, p. 221, as to render any further adjudication on our part unnecessary. Such a result, however, experience has shown to be beyond the range of possibility. The magnitude of the interests effected by the provisions of the act, together with the responsibilities which it imposes upon the officers created by it, combine to make it a starting point for questions hitherto entirely novel in the general litigation of the country, but which, for the present and prospectively, are keenly set with matters of large concern, considered in their relations to public, to corporate, and to individual rights.

The present case has about it a phase altogether new, and hence a statement, embracing its peculiarly distinguishing features, must precede necessarily its further consideration understandingly. Detached from the trammels imposed by the language of the bill, and stated rather as the drafts of the premises, the affidavits produced before us and the arguments and admissions of counsel presented it, the case discloses substantially the following features: The defendants are the lessees and occupiers of a field of coal, which, at the point where the mining operations are carried on, is oval in its shape, or which, at least does not lie in a horizontal plane. A slope has been driven from the surface downwards, following the pitch of the seam or *stratum* of coal to a very considerable depth, and at the foot of it the coal has been exhausted to the extent of about forty acres. The area thus created is denominated, in the language of the bill, "old workings of a vein called the Hillman vein." In communication with this area, or these "workings," there are several distinct outlets which extend therefrom to the surface, such as air-ways, and air-shafts, and which are separated, at least some of them, from the main slope, at their respective

places of exit on the surface, for a distance exceeding "one hundred and fifty feet," thus affording always convenient and ready means of ingress and egress available to persons employed therein.

So far, then, as these "old workings" constitute the mine or colliery of the defendants, there is, and has been hitherto, even more than a compliance with the provisions of the third section of the act of 3d March, 1870. By the terms of that section "two outlets" are enjoined, here there are six; clearly, therefore, the mine thus far is not within the legislative inhibition. The sudden and even total destruction by fire, or otherwise, of the elaborate erections pertaining to the colliery, such as the engine house, the breaker, the hoisting gearing with all its complicated and heavy machinery, would not entomb the persons employed in the mines. Indeed, considering the multiplied avenues of exit, if the main slope should be utterly closed up with burning timbers and masses of detached rock, slate or coal, the miners and other persons engaged below could scarcely be endangered at all.

The complaint of the mine inspector and plaintiff in this bill is not, however, in any sense aimed at the mine or colliery of the defendants, so far as the same is constituted by the "old workings" in the "Hillman vein;" on the contrary, it is leveled in earnest at what is alleged to be a most dangerous mischief in connection with this colliery, but which is deeper down in the earth, by several hundred feet, than the old workings of the Hillman vein.

As we have before remarked, the seam or *stratum* of coal at the point where an area of forty acres has been worked out, is oval in its shape, or, more distinctly speaking perhaps, it pitches downwards. In this area, but following still the same seam of coal, the defendants have made what is termed a *new lift*, and have pushed forwards and downwards a slope to the distance of three hundred feet and upwards. At the bottom of this slope, they have driven gangways, and opened breasts and chambers into the coal, which, as shown by the drafts submitted to us, constitute an extensive field for mining operations; here the chief product of their colliery is obtained, and here, in the language of the bill, is where they have practically opened "a new mine, and are engaged in working the same without having two shafts, slopes or outlets," &c., as required by law.

At the hearing of the case, several affidavits were presented on the part of the defendants, some of which set forth, *inter alia*, that the defendants had not made, nor were they making, a new mine "either practically, theoretically or actually;" but that, on the contrary, the mining was carried on in the same vein, in continuation simply of the prior working, and by "the ordinary method of mining practiced in this region, as well as elsewhere;" and further, that "there are two and more outlets in communication with the said vein and all its workings."

However much we may admire the adroit and general terms in which these affidavits are couched, still, we are obliged to note that they do not set up any denial of the ruling allegation contained in the plaintiff's bill of complaint. They make no averment that the seam or *stratum* of coal penetrated by this continued slope is in communication with "at least two shafts, or slopes, or outlets, *separated by natural strata, of not less than one hundred and fifty feet in breadth*, by which shafts, slopes or outlets, distinct means of ingress and egress are always available to the persons employed in the coal mine or colliery." Indeed, it was not shown by the drafts, nor claimed in the argument, that these "two and more outlets" were anything else than mere passage ways or air-ways, running along, near to and parallel with the continued slope Furthermore, the only outlets which pass out to the surface, and which were *shown* to be in communication with this particular seam or *stratum* of coal, are those communicating with the "old workings" thereof, where it is denominated as the "Hillman vein," and they have been herein previously referred to at length.

The important question raised by the plaintiff's bill of complaint on the one side, and combatted by the defendants on the other, depends almost entirely on the construction to be given to the act of 3d March, 1870, as it bears upon the particular features presented in the present case. Is this mine or colliery, projected by a slope, as it now confessedly is, down into the earth for a distance exceeding three hundred and fifty feet below the point where there are "at least two outlets, separated by natural *strata* of not less than one hundred and fifty feet in breadth," and there worked by a large number of persons in the employ of the defendants, and who are engaged in mining, raising and shipping coal, within the inhibition of law?

In support of the application for an injunction, plaintiff's counsel proffers the statute. He further relies upon the charges as contained in the bill, which he claims have not been contradicted, but, on the contrary, have been sustained both by the affidavits and by the drafts submitted in the case.

In antagonism to the application, the counsel for defendants proffers: first, the unconstitutionality of the statute; and second, its construction as laid down by this Court in Com. *ex rel.* v. Bonnell, *et al.*, before referred to; and, in this connection, he contends that, assuming the charges contained in the plaintiff's bill to be correct so far as they relate to the manner in which the mine of the defendants is operated, still, the case does not fall within the terms of the act of 3d March, 1870, but, on the contrary, it presents, *at most*, a *casus omissus;* and consequently is altogether free from any statutory ban whatever.

With regard to the constitutionality of the act of 3d March, 1870, we briefly indicated our views in Bonnell's case, before referred to. These views remain yet unshaken, notwithstanding the very able argument of the counsel for defendants in opposition thereto. We simply add in this connection that this statute, relating as it does exclusively to the manner of operating coal mines, embodies nothing less than the will of the supreme power of the Commonwealth, which every citizen, no matter what may be his interests, is bound to obey; and, therefore, until it shall be amended, altered or repealed by the same power which created it; or, at least, until a Court higher than ours shall adjudge that our construction of it has been conceived in error, we shall administer and enforce its provisions as we understand them, even though the great pecuniary interests involved in the coal production of the region, together with the varied minor interests dependent thereon, may be materially prejudiced thereby. The question considered in an aspect pertaining to the constitution, it must be remembered, is not one of ethics, nor of right, nor of expediency; it is solely one of legislative power. Quoting, as we did in Bonnell's case, substantially, from one of the very eminent jurists of our State, a constitution lays down certain great and fundamental principles, according to which the several departments it calls into existence are to govern the people; but all auxiliary rules which are to give effect to these principles must, from the necessity of the case, come from the legislature. It is for this very purpose that the constitution establishes a legislature.

Recognizing, therefore, the act in question, as the embodiment of legislative wisdom, or, in other words, the creation of legislative power, it would be not only a most unwarrantable derogation thereof, but an exercise of unblushing presumption on our part to set at naught a statute thus originated, and which was passed for the special and declared purpose of protecting the health and the lives of a very large class of citizens. It would indeed be the utterance for law of a vain and dangerous conceit of our own, in opposition to and above the aggregated wisdom and power of the whole Commonwealth. In effect it would be *making*, not *expounding* the law.

And again, adopting in substance the language contained in the opinion of this court in Bonnell's case, we say, if the legislature can prescribe conditions, regulations and rules, which are to be observed in the use of any peculiar property by the owners, what is there about coal mines specially to exempt them from similar and appropriate supervision and control? Clearly, from the very necessities incident to our system of government, a power of this character is inherent in the legislature. It has been so conceded almost from time immemorial. Indeed, the exercise of powers immediately in analogy with this, has not only thus been recognized, but the legislature has again and again delegated them to the cities and boroughs—mere creatures of statutes—throughout the State. We allude, of course, to the corporate powers of cities and boroughs, in establishing a police force; prohibiting the carrying on of any manufacture, trade or business, which may be noxious or offensive to the inhabitants, or the sale or exposure of fire-works or other inflammable and dangerous articles, and limiting and prescribing the quantities that may be kept; making such regulations as may be necessary for the health and cleanliness of said cities and boroughs; prohibiting nuisances therein; regulating markets; in short exercising a class of powers pertaining to the health and safety of the citizens of such cities and boroughs, as broad in their compass and as trammeling of what, under other circumstances, might be donominated individual right, as anything contained in the act in question affecting the rights of the owners, lessees or occupiers of coal mines.

And further, as health and life occupy in the scale of human estimation a position immeasurably above that of posessions, and as the maxim which applies undeniably to property the world over—"make use of your own in such a manner as not to injure that of another"—needs no legislative iteration to make it as operative to-day as it was at the moment of its recognition, we are not prepared to say that this act "providing for the health and safety of persons employed in coal mines," was necessary at all to give effect to the purposes it has in view. Though a positive mandate to the owners and occupiers of coal mines, that they shall so work them as not to injure the health nor endanger the lives of the persons employed therein, is it, after all, anything more than the mere embodiment in statutory form of a principle akin to natural law itself, and which springs alone from the internal dictates of reason?

In bar also to an injunction, as has before been stated, the counsel for defendants relies upon our ruling in Bonnell's case. In that case we said, referring to the third section of the act of 3d March, 1870, that it stops outright the working of every mine or colliery which has but a single opening; but there is one condition on which such a mine may still be operated. It is, that every seam or *stratum* of coal wherein mining is carried on, shall be in communication with a second outlet "separated by natural *strata* of not less than one hundred and fifty feet in breadth;" that is, the openings or outlets shall be apart on the surface, at the points of ingress and egress, at least one hundred and fifty feet. And the reason for this is clearly obvious. The outlets are to be sufficiently remote from each other, so that in case of destruction by fire, or otherwise, of the necessary erections about one outlet, the other may be used for the safe and convenient egress of the persons employed in the shaft or slope where the destruction has taken place. And further, that by the terms of the act it is immaterial whether these two outlets belong to the same mine or not. All that is posi-

tively enjoined is a second, safe and convenient means of exit for the persons employed in the mine, in case of accident. Any mine or colliery, therefore, having but a single shaft or slope, but being in communication with a second outlet, and having also the additional requisites for the safety of the persons employed therein, as prescribed by the statute, may be operated to its full capacity, and coal may be mined therein, and prepared for, and sent to market, with as much freedom as though the act had not been passed.

To this ruling we still adhere. And we repeat again what we said in that case, *under no other state of things* can a coal mine or colliery, which has but a single shaft or slope, be worked and operated in producing coal for market; and that any owner, lessee or occupier of such a coal mine or colliery, or any agent who has the care and direction thereof, and who persists in working it in contravention of the plain and reasonable requirements of the statute, is guilty of flagrant and inexcusable wrong; and any inspector of mines, who, being cognizant of the fact, but nevertheless permits or suffers such working to be carried on, is grossly neglectful of his duties.

This language followed after we had quoted at length the third section of the act, and had explained fully what *kind* of outlet was therein prescribed. It was not to be a mere air-way or passage-way within a few feet of, and parallel with, the particular shaft or slope, but it was to be an outlet *separated therefrom* by natural *strata* of not less than *one hundred and fifty feet in breadth*.

We can hardly conceive of an honest understanding so obtuse as to lay hold of a detached sentence, such as "all that is positively enjoined is a second, safe and convenient means of exit for persons employed in the mine, in case of accident," and construe it as a warrant for working a slope which extends down into the earth over three hundred feet, and which has nothing more than a passage-way or air-way distant from it far less than one hundred and fifty feet, when such a construction was plainly counter to the whole drift of the opinion, as well as in direct antagonism to the terms of the law itself.

Not only do we stand by the opinion in Bonnell's case, but to the extent that the construction of the statute therein laid down will meet the case before us, we have already applied it, holding, as we have herein, that in so far as the "old workings" of a vein called the "Hillman vein," constitute the mine or colliery of the defendants, the same is not within the legislative inhibition.

It is not, as we have said before, at these old workings of the Hillman vein, that the plaintiff's bill of complaint is leveled; nor is it in concern for them except as they are an incident of the case, but rather for the mine or colliery as worked by the *new lift*, or through the continued slope, that this earnest contest has been pressed by the defendants. Considering, then, that the mine or colliery is operated, as was shown by the drafts and conceded in the argument, by a slope continued in a seam of coal from certain old workings there, down for a distance of three hundred feet and upwards, with no second outlet communicating therewith after it leaves the old workings, except a passage-way or air-way, as has been described, another question of some importance arises, upon which it becomes our duty to pass. That question is: Does the case thus presented constitute a *casus omissus*? If it does, then undoubtedly the present application must fail; for a *casus omissus* can never be supplied by the courts. It is not the province of judges to make laws; on the contrary, it is their duty to administer them as the Legislature have made them; excepting, of course, such as infringe upon the Constitution, and these it is their duty to set at naught altogether.

The construction of statutes is for the courts, particularly where the Legislature has not been sufficiently explicit in the terms used, or in designating the subject matter to be embraced within the statutory provision; and such cases sometimes call into exercise a very responsible feature of judicial duty. The experience of centuries has not, however, failed to discover and to establish certain rules of construction which judges adhere to, and which lead to results in accord with the general interests of the State.

The sense and spirit of an act—its scope and intention—are primarily to be regarded in the construction of statutes. If the object be plain and intelligible as gathered from the whole act, then it is the duty of judges so to construe it as to suppress the mischief aimed at, and advance the remedy contemplated. And where the object is at all in doubt, though the style or title of the act is of no controlling account over its clearly expressed terms, yet as a guide to the true intention of the law-giver, the title may be considered in connection with the other parts of the act. Whenever, therefore, the intention which the makers of a statute, especially one remedial in its character, can be discovered, it ought to be followed in its construction, in a course consonant with reason, so as most effectually to meet the beneficial end in view, and to prevent a failure of the remedy.

In Pray *vs.* Edie, 1 T. R. 313, where the policy of an act of Parliament had been questioned, Lord Mansfield said: "Whatever doubts I may have in my own breast about the policy of this law, yet as long as it continues in force, I am bound to see it executed according to its meaning." And again, in the same case he says, "let us consider the mischiefs intended to be remedied, and the provisions of the act for remedying them."

The act of 3d March, 1870, has about it nothing which offers to the mind even a single doubt as to the legislative intent. Its very title—An Act providing for the health and safety of persons employed in coal mines—is suggestive of mischiefs which are to be remedied; its term embrace a catalogue of these very mischiefs by name. And not only this, but the proper means are mentioned, and are enjoined upon the owners, lessees, or occupiers of mines, whereby such mischiefs may be avoided. Maps of mines are to be prepared and kept, so that in case of the abandonment of any mine, either in whole or in part, the dangers incident to the falling of the surface may be escaped; two outlets to every seam of coal worked by a shaft or slope are to be provided, distant from each other at least one hundred and fifty feet, so that any destruction of one, either by the burning up of the hoisting gearing and other necessary erections at the surface, or the closing thereof by falls of overhanging or adjacent slate, coal or rock, may not jeopardize the lives of the persons employed therein; suitable ventilation must be secured and kept up in every mine, in order that it may be always free from noxious, poisonous, inflammable and explosive gases; where such gases exist, and cannot be expelled by a single current of air, the mine must be divided into districts, carefully separated from each other, and each must be ventilated by a distinct current of air; and when any mining operations approach abandoned workings wherein inflammable gases, or accumulations of water are suspected, bore-holes must be driven at least twenty feet in advance, so that the dangers consequent upon these accumulations, such as fire from the one and inundation from the other may not be encountered.

Recurring now to the mine or colliery of the defendants, who will say that it is not within the scope and spirit of the act? or who, that it presents a *casus omissus*? Adjudging, as we have already, that the mining operations are carried on in entire conformity with the statute, down to the point where the new lift commences, namely, the old workings in the Hilman vein, still, following on from this new lift, does not the slope continue in a seam of coal for a distance of three hundred feet and upwards, which is not in communication with a second outlet separated from said slope by "natural *strata* of not less than one hundred and fifty feet in breadth?" Thus operated and worked by the defendants, who employ a large number of persons in mining coal down at the bottom of this slope, can it yet be confidently urged that the mine is not under the ban of the statute? But it is even intimated, that being in a seam of coal which is in communication with two or more outlets, the mine is operated according to law. This is too technical by far. Very true, the seam of coal at the point where the old workings are, communicates with six different outlets and is the same penetrated by and worked at the bottom of the slope; but *down there this communication does not extend.* The six outlets from the "Hilman vein" do not communicate with the mining operations at the bottom of the slope by any second outlet "separated by natural *strata* of at least one hundred and fifty feet in breadth;" on the contrary, the extent of the communication is the slope itself, and the passage-way or air-way hereinbefore described.

We have in hand, then, a mine projected down into the very home of poisonous, inflammable and explosive gases, and connected with it, there is no second outlet as required by law. At the bottom of this mine large numbers of men are daily "engaged in mining, raising and shipping coal for market." A fall of slate or of coal, or of rock, occasioned by a faulty roof, or by an explosion of gases, might, at any moment, as effectually close up the only means of egress, namely, the slope and air-way, as did the burning timbers at Avondale and at West Pittston.

And now, to wit: February 12, 1872, after due consideration of the complainant's bill, and after hearing the arguments of counsel on the one side and on the other, it is ordered that an injunction issue in conformity with the prayer of the bill, restraining the defendants from operating their mine or colliery in connection with the new lift, or continued slope aforesaid, until the further order of the Court.

TABLE No. 1.

List of fatal accidents in the Middle district of Luzerne and Carbon counties, for the year 1872.

No. of Accident.	Date.	Name of colliery.	Location of col'ry.	Owner's or agent's name.	Names of persons kil'd	Occupation.	Age.
1,	January 5,	Baltimore, No. 1, mine	Near Wilkesbarre,	Delaware and Hudson canal co....	Phillip Combe.....	Miner	23
2,	" 9,	Niagara shaft.....	Nr. West Pittston..	Luzerne coal and iron company...	Albert Courtright	Fireman.....	19
3,	" 15,	Hollanback shaft.....	Near Wilkesbarre,	Wilkesbarre coal and iron co.....	Heartless Trevail.....	Rock miner,	25
4,	February 6,	Henry shaft.....	Plainsville.....	Luzerne coal and iron company	Patrick M'Culloch.....	Tracklayer..	54
					Robert Hayes.....	Miner	24
					Robert Norris	Engineer	24
					Patrick Barret	Miner	30
5,	March 9,	Hollanback, No. 2.....	Near Empire.....	Wilkesbarre coal and iron co.....	Benj. E. Jones.....	Driver	18
6,	" 15,	Hartford mines.....	Near Ashley.....	Wilkesbarre coal and iron co.....	George Fergeson	Laborer.....	25
7,	April 13,	Gaylord slope	Near Plymouth.....	Wilkesbarre coal and iron co.....	William C. Lewis.....	Miner.....	38

8,	April	18,	Audenreid shaft.....	Near Wilkesbarre,	Wilkesbarre coal and iron co.....	—— Mathews	Rock miner,	19
9,	May	1,	Baltimore, No. 1.....	Near Wilkesbarre,	Delaware and Hudson canal co.....	James Shearon.....	Driver	20
10,	"	9,	Gaylord slope.....	Near Plymouth.....	Wilkesbarre coal and iron co.....	William Dodson.....	Slate picker,	14
11,	"	11,	Pine Ridge shaft.....	Nr. Miner's Station	Delaware and Hudson canal co.....	David Morgan	M. engineer,	24
						David Davis.....	M. engineer,	24
12,	"	11,	Fuller's shaft.....	Near Plymouth.....	Northern coal and iron company..	James Lynch.....	Driver boy...	16
13,	"	22,	Enterprise shaft.....	Plainsville.....	Hillside coal and iron company....	John Dingwall	Mining boss,	39
14,	June	29,	Paxton mines.....	Shickshinny	Paxton coal company.....	William Thompson.....	Miner.....	49
15,	July	11,	Mill Creek drift	Mill Creek.....	Delaware and Hudson canal co.....	Isaac Gordon.....	Driver	19
16,	"	17,	Mill Creek slope.....	Mill Creek.....	Delaware and Hudson canal co.....	James Price.....	Miner.....	30

TABLE No. 1—CONTINUED.

No. of Accident.	Nationality—by birth.	Widows.....	Orphans.....	Cause of accident and remarks.	Number of persons killed.								
					Explosion of fire-damp ...	Fall of rock..	Fall of coal...	Fall down shaft.....	Bur't by gunpowder.....	By mine cars	Miscellane's, under gro'd,	Miscellane's, above gro'd,	Total.....
1,	English	1	1	Mr. Combe was injured by a fall of rock while sinking slope—died two days after the accident.....	.....	1	.....	.....	.....	.....	.....	.....	1
2,	English	.....	.....	Mr. Courtright was killed by falling down a shaft, about fifty feet, which was being sunk, at which he was a fireman. It happened on the right shift. He was last seen, before the accident, sitting at a small stone near the shaft head.	.....	.....	.....	1	.....	.....	.....	.....	1
3,	English	1	.....	Mr. Trevail, killed by falling down a shaft which was being sunk, from a swinging battery, about 30 feet..	.....	.....	.....	1	.....	.....	.....	.....	1
4,	Irish.. ..... English ..... English ..... Irish	1 1 1 1	6 ..... 1 2	Messrs. M'Culloch, Hayes, Norris and Barret were killed by an explosion of fire-damp. Mr. Barret expiring four days after the accident.....	4	.....	.....	.....	.....	.....	.....	.....	4
5,	American	.....	.....	This young man, Jones, had just jumped off an empty car on a slope, which got off the track, and caught against the timber, when the rope connections broke and let the car back, crushing Jones between it and the rib or side, which resulted in his death in two hours.	.....	.....	.....	.....	.....	1	.....	.....	1
6,	Irish	1	.....	Mr. Fergeson was killed by a piece of coal flying from a blast and striking him on the head; he had fired the blast himself, but had not reached a place of safety.	.....	.....	.....	.....	.....	.....	1	.....	1
7,	Welsh	1	3	Mr. Lewis was killed by being crushed between a mine car, in his own chamber, and the rib or pillar, while attempting to start it down grade.	.....	.....	.....	.....	.....	1	.....	.....	1

8,	English			Mr. Mathews was killed by a piece of rock falling on his head while at his usual work of sinking. It was supposed the stone fell from loose pieces lying on buntings, from blast fired some time previous.							1		1
9,	American			The young man, Shearos, lost his life by falling under a mine car while riding up a slope, and this after having been warned by persons present not to do so.						1			1
10,	American			The boy, Dodson, lost his life by falling into a Pea-coal shute in the breaker, and was suffocated before he could be taken out. The shute being drawn at the time.								1	1
11,	Welsh Welsh			Messrs. Morgan and Davis lost their lives from an explosion of fire-damp. Morgan lived 21 hours after the accident, and Davis lived 6 days, when he also expired.—See particulars in report, under head of Pine Ridge, Plan, &c.	2								2
12,	American			The boy, Lynch, was injured by being caught by car on a dirt bank outside, near the breaker. His injuries proving fatal in a few days.						1			1
13,	Scotch	1	5	Mr. Dingwall was killed by being struck on the head by a rock, which fell from the side of the shaft, while he was descending the same in the carriage. This sad accident occurred the second day after commencing to work subsequent to putting in new hoisting machinery, and new carriages in shaft; but the iron cover that belonged to said carriage had been left off at the head of the shaft until a more convenient time, had Mr. Dingwall got this cover on, the case might not have been so serious.		1							1
14,	American	1	8	Mr. Thompson, an old miner, lost his life by the falling of a piece of coal, which he knew was very unsafe, as his attention had been called to it previously by others.			1						1
15,	American			The boy, Gordon, fell under a mine car, when being struck by it on top of a self-acting plane. A car had ran over plane head, and when it struck the tip, at the foot of plane, it set the cars in motion also at the top of plane—the rope being attached, by which he was thrown under, causing almost instant death.						1			1
16,	Welsh	1	3	Mr. Price was killed by a fall of top coal, while at work sinking a slope. The same piece of coal injured another person.			1						1

TABLE No. 1—CONTINUED.

No. of Accident.	Date.	Name of colliery.	Location of col'ry.	Owner's or agent's name.	Names of persons kil'd	Occupation.	Age.
17,	August 9,	Baltimore, No. 1.....	Near Wilkesbarre,	Delaware and Hudson canal co....	Barney White.....	Miner.....	40
18,	" 12,	Tunnel, No. 2.....	Nanticoke.....	Susquehanna coal company	Valentine Zintard.....	Laborer.....	26
19,	" 21,	Sugar Notch breaker..	Sugar Notch.....	Wilkesbarre coal and iron co.....	David Snyder.	Engineer.....	30
20,	" 31,	Hollanback, No. 2.....	Near Wilkesbarre,	Wilkesbarre coal and iron co.....	Patrick Gallagher.....	Laborer.....	23
21,	Sept. 7,	Mill Creek drift	Mill Creek.....	Delaware and Hudson canal co....	Charles Davis.....	Asst. driver,	16
22,	" 10,	Empire shaft.....	Near Wilkesbarre,	Wilkesbarre coal and iron co.....	Richard Williamson...	Miner.....	53

	Sept.	11,	Washington slope	Near Plymouth....	Lehigh coal and navigation co	John J. Miller.....	Door boy	12
	"	15,	Kingston shaft.....	Near Kingston.....	Waterman and Beaver..	William Williams.....	Enginer's fireman..	23
		16,	Diamond shaft	Near Wilkesbarre	Wilkesbarre coal and iron co.....	Thomas Battles.....	Laborer.....	35
		19,	Diamond shaft.....	Near Wilkesbarre	Wilkesbarre coal and iron co.....	Patrick Brennan.....	Fire boss.....	36
27,	"	30,	Sweatland shaft.....	Near Plymouth....	Northern coal and iron company...	James Carey.....	Laborer.....	18
28,	October	4,	Sugar Notch mine	Sugar Notch	Wilkesbarre coal and iron co.....	Thomas Cronan	Miner.....	.....

TABLE No. 1—CONTINUED.

No. of Accident.	Nationality—by birth.	Widows.....	Orphans.....	Cause of accident, and remarks.	Number of persons killed.								
					Explosion of fire-damp ...	Fall of rock..	Fall of coal..	Fall down a shaft.....	Bur't by gunpowder.....	By mine cars	Miscellane's, under gro'd	Miscellane's, above gro'd	Total.....
17,	Irish.....	1	8	Mr. White was killed by a fall of slate from roof while at work in a chamber; the same fall also caught and injured his laborer.	.....	1	.....	.....	.....	.....	.....	.....	1
18,	Polander.....	1	1	Mr. Zintard was killed by a fall of top coal. He had been forbidden to go under said coal by his miner, Wm. Reese, but in his anxiety to get a piece of coal to finish loading his car, he ventured under, with the above sad consequences.	.....	.....	1	.....	.....	.....	.....	.....	1
19,	American.....	1	3	Mr. Snyder was killed by falling upon the engine while it was in motion. He was almost dead when discovered, lying on and partly entangled in the machinery.	.....	.....	.....	.....	.....	.....	.....	1	1
20,	Irish.....	.....	.....	Mr. Gallagher was killed by a fall of top coal while at his usual employment, loading coal. The coal that fell was very high over him, and consequently not easy to ascertain whether it was safe or not; but it was full of slips, as called by miners, which caused it to fall so sudden.	.....	.....	1	.....	.....	.....	.....	.....	1
21,	American.....	.....	.....	The boy, Davis, was riding on the hind end of a loaded mine car; very unexpectedly one of the front wheels broke, letting down one front corner and throwing up one of the hind corners, whereby he was caught between the car and the roof, and causing almost instant death.	.....	.....	.....	.....	.....	1	.....	.....	1
22,	Irish.....	1	6	Mr. Williamson was killed by a fall of coal; he was an old and experienced miner; he knew that the said coal was unsafe, and was preparing a blast to bring the same down; but it was more ready to fall than he anticipated, as it fell, injuring him so severely that he died in a short time afterwards.	.....	.....	1	.....	.....	.....	.....	.....	1

23,	German.....	.....	.....	The boy, Miller, was in the act of descending a slope to his work, in company with many others, when a mine car full of ashes descended the same track, struck several of the men and boys slightly, killed two mules, and striking out some props, which let down a considerable quantity of coal, under which the boy was found. The car of ashes was let down by some mistake about the fixing of the switch, or latches, near the head of the slope.	.....	.....	.....	.....	.....	1	.....	.....	1
24,	Welsh.....	.....	.....	Mr. Williams was killed by falling down shaft. He was at the time assisting the master machinist and his own brother in fixing steam pipes in the shaft, when suddenly about 125 feet of them gave away, precipitating him into the shaft, falling about 100 feet, and causing his death a few hours afterwards.	.....	.....	.....	1	.....	.....	.....	.....	1
25,	Irish.....	.....	.....	Mr. Battles was killed by a fall of top coal, while at his work of loading coal. He and his miner had been out of the chamber while a blast was being fired in the next chamber, after which they returned very soon, and had scarcely got to their work when the sad occurrence took place.	.....	.....	1	.....	.....	.....	.....	.....	1
26,	Irish.....	1	4	Mr. Brennan was killed, or rather died, from the effects of an explosion of fire damp. He was at his usual employment, examining the mines in the morning before the other workmen entered; having found fire damp in one part, the inside chambers, he returned along the main gang-way to try another place, his lamp was extinguished and he attempted to light it when he thought he was safe, but the gas ignited and he was burnt so bad that he died in two days afterwards.	1	.....	.....	.....	.....	.....	.....	.....	1
27,	American.....	.....	.....	Mr. Carey was killed by a fall of top coal while working in a chamber loading coal, &c. There could not have been placed any criminal neglect in this sad case, and yet there might have been temporary timber placed in under the same piece of coal to advantage, and if that would not have prevented the accident it would have looked better on the part of the miner at least.	.....	.....	1	.....	.....	.....	.....	.....	1
28,	Irish.....	.....	.....	Mr. Cronan was injured by a fall of top coal. His injuries were so severe that they proved fatal in fourteen days.	.....	.....	1	.....	.....	.....	.....	.....	1

TABLE No. 1—CONTINUED.

No. of Accident.	Nationality—by birth.	Widows	Orphans	Cause of accident and remark.	Number of persons killed.								
					Explosion of fire-damp ...	of rock..	Fall of coal...	Fall down shaft	Bur't by gun-powder.....	By mine cars	Miscellane's, under gro'd,	Miscellane's, above gro'd,	Total.....
29,	Irish.....	.....	.....	Mr. Hawley was severely burnt by explosion of fire-damp, so much so that he died from his injuries in 36 hours. He labored in a chamber, and as usual went to his work, but on finding that his miner was not at work he began to look for some way to make his day by filling coal, &c.; but having had experience with gas, his naked light ignited a small quantity of it, burning his face and hands, and he must have inhaled the flames.	1	.....	.....	.....	.....	.....	.....	.....	1
30,	English.....	1	2	Mr. Chase was killed by a piece of rock striking him on the head; said rock fell off a loaded car that was being hoisted up the slope, and being working about the foot as usual as footman, the same rolled down with the above sad results. His family are in England.	.....	.....	.....	.....	.....	.....	1	.....	1
31,	English.....	.....	4	Mr. Snow was killed by a fall of coal in his own chamber. He had been warned by the mine boss to take care of said coal. He had only worked 2 —— there previous to his death. His family are in England.	.....	.....	1	.....	.....	.....	.....	.....	1
32,	Irish.....	1	1	Mr. Johnson was killed by a fall of top coal. He was in the act of loading or preparing the coal for his laborer, who had a narrow escape for his life. They were robbing pillars, a very dangerous part of mining; but Mr. J. was an experienced miner and was considered a competent man for such a task.	.....	.....	1	.....	.....	.....	.....	.....	1
33,	Irish.....	1	1	Mr. M'Gurk was killed by being caught and crushed under hoisting carriage. He was crossing under at the time. It was entirely uncalled for, as there was plenty of room on each end of shaft foot for passing. His family are in England.	.....	.....	.....	.....	.....	.....	.....	.....	1

34,	Irish.....	.....	.....	The boy, Clark, came to his death by being caught in machinery. He was at work a few moments previous in a safe place, picking slate. It appears he was making an effort to pass out of the breaker without being detected by his boss, and in crawling out under the schutes, &c., he came in contact with a revolving shaft, where his clothing caught with the above result. This was the boy's own fault, as no person had an occasion or right to go into such a place.	.....	.....	.....	.....	.....	.....	.....	.....	1	1
35,	Irish.....	1	3	Mr. O'Conner was killed by a fall of top coal, (or blacksmith coal.) He was laboring in an air-way. The miner, in the presence of several others, had been prying with his drill, endeavoring to bring the same down a short time previous, but failed, and thinking it comparatively safe both began to work under it, resulting as above stated, besides slightly injuring the miner. His family are in Ireland.	.....	.....	1	.....	.....	.....	.....	.....	1
36,	Irish.....	.....	.....	Mr. M'Mannis was killed by a fall of coal while he was laboring for his father, who was also very seriously injured. He had only worked some 2 or 3 days inside of mine previous to the sad occurrence.	.....	.....	1	.....	.....	.....	.....	.....	1
		21	61		8	3	12	3	.....	7	4	5	40

TABLE No. 2.

List of accidents not proving fatal in the Middle division of Luzerne and Carbon counties, for the year 1872.

No. of Accident.	Date.	Name of colliery.	Location of colliery	Owner's or agent's name.	Name of persons inju'd.	Occupation.	Age.
1,	January 5,	Baltimore, No. 1	Near Wilkesbarre,	Delaware and Hudson coal co.	William Phillips	Miner.	
2,	" 7,	Lana shaft	Plymouth.	Wilkesbarre coal and iron co.	George Stockton	Rock miner,	
2,	" 7,	Lana shaft	Plymouth.	Wilkesbarre coal and iron co.	John Moon	Rock miner,	
3,	" 9,	Mineral Spring mine	Mineral Spring.	Mineral Spring coal co.	Charles Babcoke	Driver boy	
4,	" 11,	Baltimore, No. 2	Near Wilkesbarre,	Delaware and Hudson coal co.	Philip Boyle	Miner.	
4,	" 11,	Baltimore, No. 2	Near Wilkesbarre,	Delaware and Hudson coal co.	Dennis Hanlin	Laborer.	
5,	" 16,	Diamond shaft	Near Wilkesbarre,	Wilkesbarre coal and iron co.	John Mulherin	Laborer.	
6,	" 18,	Hollanback, No. 3	Near Wilkesbarre,	Wilkesbarre coal and iron co.	Mike Frally	Driver boy.	18
7,	" 21,	Laurel Run slope.	Nr. Parson's sta'n,	Delaware and Hudson coal co.	James Jones	Driver boy.	
8,	" 22,	Nottingham shaft.	Near Plymouth.	Broderick & Co.	John J. Thomas	Miner.	45
9,	" 25,	Audenried shaft	Near Wilkesbarre,	Wilkesbarre coal and iron co	R. W. Farell	Rock miner,	40
10,	" 26,	Diamond shaft	Near Wilkesbarre,	Wilkesbarre coal and iron co.	Lawrence Cassy	Laborer.	23
11,	" 29,	Empire shaft	Near Wilkesbarre,	Wilkesbarre coal and iron co.	Ed. M'Ginnis	Laborer.	
,	" 29,	Empire shaft	Near Wilkesbarre,	Wilkesbarre coal and iron co.	Reese Reese	Miner.	
,	" 31,	Avondale shaft	Near Plymouth.	D., L. and W. R. R. company	Patrick Malarkey.	Laborer.	40
14,	" 31,	Avondale shaft	Near Plymouth.	D., L. and W. R. R. company	John Sweeny	Laborer.	21
5,	February 9,	Conyngham shaft.	Near Wilkesbarre,	Delaware and Hudson coal co.	John Tar	Rock miner,	38
,	" 13,	Baltimore, No. 2	Near Wilkesbarre,	Delaware and Hudson coal co.	Rodger Johnson	Laborer.	35
	" 15,	Pine Ridge shaft	Near Wilkesbarre,	Delaware and Hudson coal co.	Daniel Lewis	Miner.	
	" 15,	Grand tunnel	Near Plymouth.	S. coal and iron company.	Hugh Bamrick	Miner.	
	" 15,	Kingston shaft	Kingston	Waterman and Beaver	George Morgan	Miner.	43

20,	Feb.	15,	Conyngham shaft.....	Near Wilkesbarre,	Delaware and Hudson canal co....	John Loyd.....	Laborer.....	40
20,	"	15,	Conyngham shaft.....	Near Wilkesbarre,	Delaware and Hudson canal co....	Jim Crain.....	Laborer.....	.....
21,	"	16,	Empire shaft.....	Near Wilkesbarre,	Wilkesbarre coal and iron co.....	William Conner.....	Miner.....	32
22,	"	19,	Paxton mines.....	Shickshinny.....	Paxton coal company.....	George Stout.....	Miner.....	.....
23,	"	19,	Audenried shaft.....	Near Wilkesbarre,	Wilkesbarre coal and iron co.....	Thomas Nicholson.....	Miner.....	.....
23,	"	19,	Audenried shaft.....	Near Wilkesbarre,	Wilkesbarre coal and iron co.	Robert Gregg.....	Miner.....	.....
24,	"	28,	Empire shaft.....	Near Wilkesbarre,	Wilkesbarre coal and iron co.....	John Cavanaugh.....	Door boy.....	14
25,	March	7,	Enterprise shaft.....	Plainsville.....	Hillside coal and iron company...	Albert Carey	Laborer.....	.....
26,	"	12,	Pine Ridge shaft.....	Near Wilkesbarre,	Delaware and Hudson canal co....	Mathew Rawlings.....	Miner.....	.....
27,	"	14,	Hartford mine.....	Near Ashley.....	Wilkesbarre coal and iron co.....	John Barret.....	Miner.....	35
28,	"	14,	Empire mines.....	Near Wilkesbarre,	Wilkesbarre coal and iron co.....	Joseph Thomas.....	Miner.....	.....
29,	"	15,	Maltby shaft.....	Near Wyoming.....	Wilner & Co.....	Joseph Martin.....	Laborer.....	.....
30,	"	21,	Laurel Run mine.....	Nr. Parson's stati'n	Delaware and Hudson canal co....	John Fox.....	Laborer.....	38
31,	April	6,	Mill Creek mine.....	Mill Creek.....	Delaware and Hudson canal co....	John Evans.....	Miner.....	.....
32,	"	17,	No. 1 shaft.....	Near Plymouth.....	Northern coal and iron company..	William Behl.	Driver boy...	.....
33,	"	20,	Enterprise shaft.....	Plainsville.....	Hillside coal and iron company ...	William Rodda.....	Laborer.....	28
34,	"	20,	Baltimore, No. 1.....	Near Wilkesbarre,	Delaware and Hudson canal co....	Peter Sharp.....	Miner.....	40
35,	"	25,	Mineral Spring mine..	Mineral Spring.....	Mineral Spring coal company.....	Samuel Borda.....	Miner.....	20
36,	"	27,	Empire shaft.....	Near Wilkesbarre,	Wilkesbarre coal and iron co.....	John Lankshire	Laborer.....	31
37,	"	29,	Laurel Run slope.....	Nr. Parson's stati'n	Delaware and Hudson canal co....	B. M'Groarty.....	Miner.....	37
38,	May	8,	Chauncey mine.....	Near Plymouth.....	Albrighton, Roberts & Co.....	Thomas Warren.....	Miner.....	30
39,	"	11,	Dodson shaft.....	Near Plymouth.....	Wilkesbarre coal and iron co.....	William Walters.....	Miner.....	50
40,	"	11,	Pine Ridge shaft.....	Near Wilkesbarre,	Delaware and Hudson canal co....	Thomas Morgan.....	M. engineer,	23
40,	"	11,	Pine Ridge shaft.....	Near Wilkesbarre,	Delaware and Hudson canal co....	Evan Davis.....	Mining do...	20

TABLE No. 2—CONTINUED.

No. of Accident.	Date.	Name of colliery.	Location of col'ry.	Owner's or agent's name.	Names of persons inj'd.	Occupation.	Age.
41,	May 29,	Mill Creek mine.....	Mill Creek.....	Delaware and Hudson canal co.....	Henry Gibbons.....	Miner.....	.....
42,	" 30,	Gaylord slope.....	Near Plymouth....	Wilkesbarre coal and iron co.....	C. Castner	Breaker boy	16
43,	" 30,	Mill Creek slope.....	Mill Creek.....	Delaware and Hudson canal co.....	W. Murphy.....	Miner.....	.....
44,	" 31,	Hutchison shaft.....	Near Kingston.....	Charles Hutchison & Co.....	John Hazle.....	Slate picker,	10
45,	" 31,	Grand Tunnel mine....	Near Plymouth....	Susquehanna coal company	R. E. M'Minn	Laborer.....	.....
46,	June 8,	Burroughs shaft.....	Plainsville.....	Luzerne coal and iron company...	John Jenkins.....	Miner.....	.....
47,	" 8,	Empire, No. 2, slope...	Near Wilkesbarre,	Wilkesbarre coal and iron co.....	John Beers.....	Miner.....	35
48,	" 8,	No. 1 slope.....	Nanticoke	Susquehanna coal company.....	Frank Dugnon	Miner.....	26
49,	" 8,	No. 1 tunnel.....	Nanticoke	Susquehanna coal company	John Dabarr.....	Laborer.....	35
50,	" 8,	No. – breaker.....	Nanticoke	Susquehanna coal company	Edward Frazier	Breaker boy	16
51,	" 19,	No. 1 slope.....	Nanticoke	Susquehanna coal company	J. O'Brien, Jr.....	Miner.....	26
52,	" 25,	No. 2, Baltimore slope,	Near Wilkesbarre,	Delaware and Hudson canal co.....	William Krebbs	Miner.....	25
53,	" 25,	Hollanback colliery...	Plainsville.....	Elliott & Co.....	Patrick Nowling.....	Laborer.....	.....
54,	" 26,	No. 1 shaft.....	Near Plymouth....	Northern coal and iron company..	Thomas Toomer.....	Driver boy...	.....
55,	" 26,	No. 1 shaft.....	Near Plymouth....	Northern coal and iron company..	Samuel Smith.....	Miner.....	.....
56,	" 26,	Franklin mine.....	Near Wilkesbarre,	Franklin coal company.....	John A. Jones.....	Miner.....	30

57,	June	29,	Empire shaft	Near Wilkesbarre,	Wilkesbarre coal and iron co	Gormar Williams	Driver	
58,	July	9,	Empire shaft	Near Wilkesbarre,	Wilkesbarre coal and iron co	William Thomas	Driver boy	14
59,	"	11,	No. 2 tunnel	Nanticoke	Susquehanna coal company	Reese W. Reese	Miner	45
60,	"	11,	Henry shaft	Plainsville	Luzerne coal and iron company	John Hayes, Sr.	Miner	
61,	"	20,	Mill Creek mine	Mill Creek	Delaware and Hudson coal co	D. J. Jones	Miner	28
62,	"	23,	Mill Creek mine	Mill Creek	Delaware and Hudson coal co	Ivor Howels	Driver boy	14
63,	August	1,	Dodson shaft	Near Plymouth	Wilkesbarre coal and iron co	Jonathan Pilget	Stable boss	22
64,	"	2,	Hartford mine	Near Ashley	Wilkesbarre coal and iron co	Richard Murry	Miner	27
65,	"	7,	Nottingham shaft	Near Plymouth	Luzerne coal and navigation co	Martin Conway	Car runner	28
66,	"	9,	No. 1, Baltimore	Near Wilkesbarre,	Delaware and Hudson coal co	Michael Titrick	Laborer	30
67,	"	10,	Empire shaft	Near Wilkesbarre,	Wilkesbarre coal and iron co	William R. Harrison	Miner	26
68,	"	10,	Franklin mine	Near Wilkesbarre,	Franklin coal company	John T. Jones	Miner	30
69,	"	12,	Henry shaft	Plainsville	Luzerne coal and iron company	John Thomas	Fire boss	
69,	"	12,	Henry shaft	Plainsville	Luzerne coal and iron company	John M. Howell	Fire boss	
69,	"	12,	Henry shaft	Plainsville	Luzerne coal and iron company	William Morgan	Miner	
70,	"	22,	Hartford mine	Near Ashley	Wilkesbarre coal and iron co	John Kinsman	Miner	45
71,	"	27,	No. 2 slope	Nanticoke	Susquehanna coal company	William Dodds	Miner	30
72,	"	29,	No. 3 slope	Wanamie	Lehigh coal and navigation co	George Marsden	Miner	24
73,	Sept.	2,	Henry shaft	Plainsville	Luzerne coal and iron company	Michael Duddy	Miner	
74,	"	3,	Slope, No. 3	Wanamie	Lehigh coal and navigation co	George Pelts	Miner	56
75,	"	7,	Maffet's slope	Plainsville	Wilkesbarre and Seneca lake coal company	John Rudman	Driver boy	
76,	"	7,	No. slope	Nanticoke	Susquehanna coal company	Isaac D. Williams	Miner	23
77,	"	12,	Sweatland shaft	Near Plymouth	N. C. and iron company	Jacob Bush	Miner	
78,	"	12,	Empire, No. 4	Near Wilkesbarre,	Wilkesbarre coal and iron co	Patrick O'Grady	Miner	34

TABLE No. 2—CONTINUED.

No. of Accident.	Nationality—by birth.	Cause of accident and remarks.	Number of persons injured.									
			Explosion of fire-damp	Fall of rock	Fall of coal	Fall down a shaft	Bur't by gunpowder	By mine cars	Miscellane's, under gro'd	Miscellane's, above gro'd	Total
41,	Irish	Mr. Gibbons had a leg broke, and otherwise injured, by a fall of coal in his working place.			1						1
42,	American	The boy, Castner, had a leg broken by attempting to get on a car on the dirt plane at breaker.						1			1
43,		Mr. Murphy had an arm broken and otherwise injured from a blast exploding before he got to a place of safety.							1		1
44,	Scotch	The boy, Hazle, lost an arm by being caught in machinery in breaker. He was in a place—during a rest that they had—that no one had any right or need to go. The machinery in the breaker was well fenced.								1	1
45,	American	Mr. M'Minn had a leg broken and back bruised by being caught by a mine car.						1			1
46,	American	Mr. Jenkins was seriously injured by fall of rock—hip out of place and ankle injured.		1							1
47,	Irish	Mr. Beers was injured by being crushed between mine cars while descending slope.						1			1
48,	Irish	Mr. Dugnon was seriously injured by a fall of top coal			1						1
49,	Polander	Mr. Dabarr was injured, not very seriously, by a fall of top coal.			1						1
50,	American	The boy, Frazier, was injured by falling from a ladder in breaker.								1	1
51,	Irish	Mr. O'Brien was slightly burnt by powder, a spark having fell in keg.					1				1
52,	German	Mr. Krebbs was burnt by an explosion of fire-damp. He had been brushing out gas, and did not take his safety but a naked lamp to his work, with the above result.	1								1
53,	Irish	Mr. Nowling was slightly burnt by fire-damp—he entered the chamber before his miner had come.	1								1
54,		The boy, Toomer, was severely injured, but no bones broken, by being run over by car on dirt bank.								1	1
55,	English	Mr. Smith was crushed by a mine car, while assisting to put the same on the track.						1			1
56,	Welsh	Mr. Jones was injured on his head by a fall of coal, not seriously,			1						1

57,	Welsh	The young man, Williams, was caught and crushed between mine cars—injured severely.	.....	.....	.....	.....	.....	1	.....	.....	1
58,	Welsh	The boy, Thomas, was caught and fell under mine cars—had one leg broken and otherwise injured.	.....	.....	.....	.....	.....	1	.....	.....	1
59,	Welsh	Mr. Reese had his arm fractured from a fall of slate from roof....	.....	1	.....	.....	.....	.....	.....	.....	1
60,	English.	Mr. Hayes was slightly burnt by explosion of fire-damp.....	1	.....	.....	.....	.....	.....	.....	.....	1
61,	Welsh	Mr. Jones was injured by being struck on hip by a piece of coal from blast, in next chamber, as he was entering, &c.....	.....	.....	.....	.....	.....	.....	1	.....	1
62,	Welsh	The boy, Howels, had his leg injured by being crushed between a mule and a mine car.	.....	.....	.....	.....	.....	1	.....	.....	1
63,	American.....	Mr. Pilget was slightly burnt by an explosion of fire-damp, by disobeying the orders of a fire-boss.	1	.....	.....	.....	.....	.....	.....	.....	1
64,	Irish.....	Mr. Murry was injured by a fall of coal—had one leg and two of his ribs broken.	.....	.....	1	.....	.....	.....	.....	.....	1
65,	....	Mr. Conway was seriously injured by being crushed between a mine car and a door frame.	.....	.....	.....	.....	.....	1	.....	.....	1
66,	Irish.....	Mr. Titrick was injured by a fall of slate; his miner, Mr. Barney White, being killed by same fall.	.....	1	.....	.....	.....	.....	.....	.....	1
67,	Welsh	Mr. Harrison was seriously injured by being struck by a piece of coal from a blast he had just fired—it fractured his skull and cheek-bone, and deprived him of one eye.	.....	.....	.....	.....	.....	.....	1	.....	1
68,	Welsh	Mr. Jones was seriously injured by falling from a ladder in chamber.	.....	.....	.....	.....	.....	.....	1	.....	1
69, 69, 69,	Welsh ..... Welsh .. .. Welsh	Messrs. Thomas, Howells and Morgan were slightly burnt by explosion of fire-damp in chamber.	3	.....	.....	.....	.....	.....	.....	.....	3
70,	English..	Mr. Kinsman had some bones of left foot fractured by being caught between two pieces of coal sliding.	.....	.....	.....	.....	.....	.....	1	.....	1
71,	English..... ..	Mr. Dodds had a shoulder blade broken by a fall of top coal.....	.....	.....	1	.....	.....	.....	.....	.....	1
72,	English.....	Mr. Marsden was injured by a fall of top coal; head and foot bruised badly.	.....	.....	1	.....	.....	.....	.....	.....	1
73,	Irish.....	Mr. Duddy was injured on face and hip by the explosion of a blast; he was going back to re-touch it when it exploded.	.....	.....	.....	.....	.....	.....	1	.....	1
74,	American.....	Mr. Pelts was burnt by an explosion of fire-damp, and was more serious than at first supposed. This happened through willful neglect on the part of the fire-boss, George Shanks.	1	.....	.....	.....	.....	.....	.....	.....	1
75,	German.....	The boy, Redman, had his arm broken, having been caught between a mine car and a prop.	.....	.....	.....	.....	.....	1	.....	.....	1
76,	Welsh	Mr. Williams had his collar bone broken by fall of coal.....	.....	.....	1	.....	.....	.....	.....	.....	1
77,	....	Mr. Bush had a leg broken by a fall of slate in chamber...	.....	1	.....	.....	.....	.....	.....	.....	1
78,	Irish.....	Mr. O'Grady was in the act of re-touching a blast, when it exploded, inflicting severe wounds, but no bones were broken.	.....	.....	.....	.....	.....	.....	1	.....	1

TABLE No. 2—CONTINUED.

No. of Accident.	Date.	Name of colliery.	Location of col'ry.	Owner's or agent's name.	Names of persons injured.	Occupation.	Age.
79,	Sept. 16,	Henry shaft	Plainsville.....	Luzerne coal and iron company...	John Hayes, Jr.....	Miner.....	35
80,	" 16,	No. 3 breaker.....	West Nanticoke ...	Susquehanna coal company	John Hart.....	Driver boy...	16
81,	" 24,	Mill Creek mine.....	Mill Creek.....	Delaware and Hudson canal co.....	George Kridler.....	Driver	20
82,	" 28,	Avondale shaft.....	Below Plymouth..	D., L. and W. railroad company..	Robert Fisher.....	Miner.....	50
83,	" 28,	Hartford mine.....	Near Ashley.....	Wilkesbarre coal and iron co.....	Daniel E. Thomas.....	Miner.....	45
84,	" 30,	Hartford mine.....	Near Ashley.....	Wilkesbarre coal and iron co.....	John Kinney.....	Driver	20
85,	" 30,	Conyngham shaft.....	Near Wilkesbarre,	Delaware and Hudson canal co.....	Peter Shells.....	Rock miner,	25
86,	October 1,	No. 2 shaft.....	Near Wilkesbarre,	Delaware and Hudson canal co.....	David Goronway	Miner.....	28
87,	" 1,	Henry shaft.....	Plainsville	Luzerne coal and iron company...	John Malin.....	Miner.....	.....
88,	" 2,	Nottingham shaft.....	Near Plymouth....	Lehigh coal and navigation co.....	John Hoover.....	Miner.....	50
89,	" 4,	Laurel Run slope.....	Near Parson's S....	Delaware and Hudson canal co.....	Charles Mehan.....	Driver.....	.....
90,	" 4,	Avondale shaft.....	Near Plymouth....	D., L. and W. railroad company...	John Evans.	Laborer.....	24
91,	" 8,	No. 2 shaft.....	Near Wilkesbarre,	Delaware and Hudson canal co.....	Charles Warner.....	Driver boy..	16
92,	" 11,	Henry shaft.....	Plainsville	Luzerne coal and iron company ...	William Wright.....	Miner.....	.....

93,	October	14,	Empire shaft	Near Wilkesbarre,	Wilkesbarre coal and iron co	James Smith	Miner.	
94,	"	17,	Diamond shaft	Near Wilkesbarre,	Wilkesbarre coal and iron co.	Ferrel Jennings	Miner.	42
95,	"	17,	Empire shaft	Near Wilkesbarre.	Wilkesbarre coal and iron co	William Henyan	Miner.	
96,	"	17,	Empire shaft	Near Wilkesbarre,	Wilkesbarre coal and iron co	Andrew Lanning.	Miner.	
97,	"	23,	No. 1 tunnel	Nanticoke.	Susquehanna coal company.	Charles Houser.	Miner.	24
98,	"	25,	No. 1 breaker	Nanticoke.	Susquehanna coal company	John Rook.	Laborer.	19
99,	"	28,	Avondale shaft	Near Plymouth.	D., L. and W. R. R. company.	Tim Buckley.	Laborer.	45
100,	"	30,	Pine Ridge shaft.	Near Miner's sta'n,	Delaware and Hudson canal co	John Burke.	Laborer.	
101,	"	30,	No. 3 slope	Wanamie	Lehigh coal and navigation co.	John Johns.	Miner.	32
102,	Nov.	5,	Grand tunnel	Near Plymouth.	Susquehanna coal company.	Ed. E. Davis	Miner.	
103,	"	8,	No. 2 shaft	Near Wilkesbarre,	Delaware and Hudson canal co.	Poartley Ford	Driver boy	15
104,	"	11,	No. 3 slope	Near Wilkesbarre,	Delaware and Hudson canal co	James Arington.	Miner.	
105,	"	16,	No. 4 shaft	Near Plymouth	N. coal and iron company	John Burke.	Miner.	
108,	"	19,	Port Bowkley slope.	Plainsville	Hillside coal and iron company.	John Shoolin	Miner.	
109,	"	20,	No. 5 shaft	Plymouth.	N. coal and iron company.	John Schooley	Laborer.	
110,	"	30,	Hartford mine	Near Ashley	Wilkesbarre coal and iron co	John Blewitt	Miner.	43
111,	Dec.	6,	No. 2 colliery.	Near Ashley	New Jersey coal company	Thomas M'Mannis, Sr.	Miner.	45
112,	"	14,	No. 1 breaker.	Nanticoke.	Susquehanna coal company.	Benjamin Korp.	Laborer.	43
113,	"	14,	Enterprise slope	Plainsville.	H. C. and I. company.	Michael Waters.	Door-tender,	14
114,	"	17,	Enterprise slope	Plainsville.	H. C. and I. company.	Patrick Burke	Miner.	
115,	"	17,	Enterprise slope	Plainsville.	H. C. and I. company.	John Taylor	Driver boy.	16
116,	"	23,	No. — tunnel	Near Wilkesbarre,	Delaware and Hudson canal co.	Silas Manley.	Miner.	25

TABLE No. 2—CONTINUED.

No. of Accident.	Nationality—by birth.	Cause of accident and remarks.	Number of persons injured.								
			Explosion of fire-damp	Fall of rock	Fall of coal	Fall down a shaft	Bur't by gunpowder	By mine cars	Miscellane's, under gro'd	Miscellane's, above gro'd	Total
79,	English	Mr. Hayes was in the act of filling or touching a blast, when the gas, escaping from the hole through blasting barrel, ignited and set fire to the straw, causing the blast to explode, from which Mr. H. received severe injuries—one thigh broken and a flesh wound on one arm.							1		1
80,	Irish	The boy, Hart, was injured severely by car running over him on dirt bank; but no bones were broken.								1	1
81,	American	The young man, Kridler, was injured severely—legs bruised, flesh wounds on his face—by being crushed between car and pillar.						1			1
82,	English	Mr. Fisher had his arm and head injured by a fall of coal			1						1
83,	Welsh	Mr. Thomas had a leg broken, and bruised about the body by a fall of top coal.			1						1
84,	Irish	Mr. Kinney had his collar bone broken by uncoupling cars						1			1
85,	Irish	Mr. Sheils had his skull fractured by a piece of rock falling upon his head; it is supposed that it fell from the timber overhead.							1		1
86,	Welsh	Mr. Goronway was slightly burnt by fire-damp, through his own carelessness in not using safety in brushing out gas.	1								1
87,	Irish	Mr. Malin was injured in the back by a piece of rock falling upon him while working in shaft.		1							1
88,	American	Mr. Hoover had a leg broken, and otherwise injured, by a fall of coal.			1						1
89,	Irish	The boy, Mehan, was severely injured by a mine car running off the track and striking out a prop, which struck him on the back.							1		1
90,	Welsh	Mr. Evans was injured on the hip, a piece of coal striking him							1		1
91,	German	The boy, Warner, had a leg broken, by being caught between car and door.						1			1
92,	English	Mr. Wright was injured by a fall of top coal			1						1

93,	English.....	Mr. Smith had his face and hands badly burnt by explosion of fire-damp; all through his own carelessness, in not using his safety after brushing out gas.	1	.....	.....	.....	.....	.....	.....	.....	1
94,	Irish.....	Mr. Jennings had his face and hands badly burnt by explosion of fire-damp. This occurred by disobeying orders given by mine boss.	1	.....	.....	.....	.....	.....	.....	.....	1
95,	Irish.....	Mr. Henyan was injured on back by fall of coal.	.....	.....	1	.....	.....	.....	.....	.....	1
96,	Irish...	Mr. Lanning had a severe flesh wound on leg, being struck by a plank while putting in a schute.	.....	.....	.....	.....	.....	.....	1	.....	1
97,	German.....	Mr. Houser was slightly injured by a premature explosion of a blast.	.....	.....	.....	.....	.....	.....	1	.....	1
98,	German.	Mr. Rook had a leg broken, being jammed between cars outside.	.....	.....	.....	.....	.....	1	.....	.....	1
99,	Irish.....	Mr. Buckley had a leg broken and severe flesh wounds, from a piece of loose coal rolling upon him in chamber.	.....	.....	.....	.....	.....	.....	1	.....	1
100,	Irish	Mr. Burke was injured severely—had one arm and several ribs broken, by empty cars striking him on slope.	.....	.....	.....	.....	.....	1	.....	.....	1
101,	Welsh	Mr. Johns was slightly burnt by explosion of fire-damp; all through his own carelessness.	1	.....	.....	.....	.....	.....	.....	.....	1
102,	Welsh.....	Mr. Davis had his shoulder bone broken by a fall of coal.....	.....	.....	1	.....	.....	.....	.....	.....	1
103,	Irish...	The boy, Ford, received severe flesh wounds on his leg, by a car running partly over it on dirt bank.	.....	.....	.....	.....	.....	.....	.....	1	1
104,	English..... ...	Mr. Arington was slightly burnt by explosion of fire-damp..	1	.....	.....	.....	.....	.....	.....	.....	1
105,	Irish...	Mr. Burk had a leg broken, being caught by a car while passing.	.....	.....	.....	.....	.....	1	.....	.....	1
108,	Irish...	Mr. Shoolin was injured by a fall of coal while in a neighbor's chamber.	.....	.....	1	.....	.....	.....	.....	.....	1
109,	Irish...	Mr. Schooley had one hand severely injured while coupling cars.	.....	.....	.....	.....	.....	.....	1	.....	1
110,	English.....	Mr. Blewitt had his jaw bone fractured by a fall of coal.....	.....	.....	1	.....	.....	.....	.....	.....	1
111,	Irish...	Mr. M'Mannis was very seriously injured by a fall of coal, by which his son, laboring for him, was instantly killed. They were just opening a new chamber on gang-way, and only worked 2 days there previous.	.....	.....	1	.....	.....	.....	.....	.....	1
112,	American.....	Mr. Korp had leg broken by a piece of timber rolling up it outside new breaker, No. 1.	.....	.....	.....	.....	.....	.....	.....	1	1
113,	American.....	The boy, Walters, had an arm broken by getting into car at foot of slope.	.....	.....	.....	.....	.....	.....	1	.....	1
114,	Irish.....	Mr. Burke had his face and hands burnt considerable, by going into places he had no right to at night, after having finished his shift.	1	.....	.....	.....	.....	.....	.....	.....	1
115,	English.....	The boy, Taylor, had the small bone of his arm broken while uncoupling his trip of cars.	.....	.....	.....	.....	.....	1	.....	.....	1
116,	English.	Mr. Manley had a leg broken by a piece of coal falling upon it...	.....	.....	1	.....	.....	.....	.....	.....	1
			24	10	23	3	3	24	27	7	121

REPORT

OF THE

INSPECTOR OF COAL MINES OF THE WYOMING COAL FIELD, LUZERNE COUNTY, LYING EAST OF AND INCLUDING JENKINS TOWNSHIP, FOR 1872.

His Excellency, JOHN F. HARTRANFT,

Governor of the Commonwealth of Pennsylvania:

SIR:—In compliance with the requirements of an act of the General Assembly, approved the 3d day of March, A. D., 1870, providing for the health and safety of persons employed in coal mines, &c., I have the honor to herewith submit my report for the year ending the 31st day of December, A. D., 1872;

By reference to the tabulated and general report hereto attached, your Excellency will observe the number of coal mines and collieries that have been inspected, and statements as to their general condition, showing the number of shafts, slopes and tunnels; the number of breakers, screens and schutes for preparing, cleaning and loading coal; the means of ventilation; the number of persons employed at each mine or colliery, and the number of tons of coal mined at each colliery; also the number of steam engines and boilers, with the horse power of each; the name of veins worked and average thickness of each vein, and all other information which the mine ventilation laws of 1870 demand.

I have arranged all accidents in a tabular form. Table No. 1 shows those resulting in actual death; table No. 2 shows the serious accidents or those not resulting fatally.

I have also arranged in a tabular form the number and name of each coal mine and colliery; where it is located; by whom operated; the manner in which each is ventilated; the number and description of opening at each colliery; the number of persons employed in each and the amount of coal mined at each colliery.

I have caused legal proceedings to be taken to punish infringments of the law, viz: Against the working of the Eagle shaft mine, Pittston, on account of standing gas in the mine. I herewith transmit Judge Dana's opinion granting an injunction. Also against the fire boss in Pine Brook shaft, Scranton, for neglect of duty, allowing persons to go into the mine when there was gas in it to a dangerous extent. Also against a miner in Hampton shaft, for neglecting to prop and secure the roof in his chamber, which afterwards fell, killing one man. The two last cases are now pending in the Mayor's court of the city of Scranton.

I would most respectfully recommend the printing of the mine ventilation laws of 1870, in all the mine inspectors' reports, if there are any printed this year, for distribution, as it would be a source of information to the parties who require it.

It has occupied considerable of my time in writing out my report for 1872, as I had to describe each mine in detail, as my report for 1871 was not published with the other mine inspectors' reports. It was omitted through no fault of mine, as I transmitted it to the Governor and he sent it to the Senate on the 25th of January, 1872.

I have received universal courtesy and assistance from all parties with whom I had any official business transactions in this mining district, for which I return them my sincere thanks.

By computing the area of square miles in this mining district, which contains coal beneath its surface, from the most reliable data, I find that Jenkins township contains 9 square miles, Pittston township and borough contains 11 square

miles, Ransom township 1 square mile, Old Forge township 5 square miles, Lackawanna township 7 square miles, Scranton city and Dunmore borough 16 square miles, Blakeley township 21 square miles, and Carbondale township, Carbondale City and Fell township 21 square miles; in all 91 square miles. There are 77 square miles lying on both sides of the Lackawanna river, and 14 square miles lying east of the Susquehanna river, in Jenkins township and part of Pittston, which is in the Wyoming valley. The Lackawanna river runs for a distance of 27 miles in Luzerne county, through the coal measures, and the coal extends into Susquehanna county for some distance. This mining district is 31 miles long and it averages nearly 3 miles wide.

The condition of three-fourths of the mines in this mining district will compare favorably with any in the State of Pennsylvania as to their permanent construction, system, safety and ventilation; the others require some mechanical power to be used as a means of ventilation. Mines that are ventilated by the action of the atmosphere cannot comply with the mine ventilation laws of 1870. At certain times and seasons of the year, when the temperature is the same in the mines as it is outside, there cannot be any ventilation or circulation of air inside the mines if there is not some mechanical power used, as it is the difference of temperature that causes a circulation of air in the mines. The mine ventilation laws of 1870 require a steady current of air at all times in the mines, hence it follows that mines ventilated by the action of the atmosphere cannot comply with the laws. In all the new mines that are in course of construction the parties are to have them ventilated by suction-fans. In the old mines that have been worked for years and that are now ventilated by natural means, the operators are building furnaces, &c., and by the time I make my next report I expect it will show a great improvement in this district for the year 1873.

The following is the decision of Judge Dana, in the case of Inspector Blewitt *vs* Alva Tomkins, which involves important matter relating to the Mine Ventilation Law, and is of great interest to both operators and men:

Commonwealth *ex relatione*, Patrick Blewitt, Inspector of Mines, *vs.* Alva Tomkins. } Important decision. In the Court of Common Pleas of Luzerne county.

1*st*. The defendant's mine, at the point where workings are going on, is free from standing gas, but these workings connect with and open into old-abandoned workings where standing gas accumulates, flows and by frequent falling of the roof, is liable to be driven into the defendant's workings, to affect the air and to cause destructive explosions: held, that under these circumstances and thus connected, "the entire mine is not free from danger to the lives and health of the men," nor in a fit state for them to work therein, as required by the ventilation act, and an injunction awarded.

2*d*. A mine is not free from danger when it actually exists within the mine, simply because the danger originates in causes located a few feet or yards beyond and outside of the boundary line. The act deals with its presence, not its origin.

3*d*. The act does not require that a mine be kept absolutely clear of gas, for this is impossible; but as fast as evolved, it is by the introduction of pure air and the process of ventilation "diluted, rendered harmless and expelled," and its accumulation as and so as to fall within the designation of "standing gas" avoided.

Opinion by Dana, A. L. J.

The bill in this case discloses the facts:

That the defendant is the lessee of a coal mine in Pittston township, Luzerne county, known as the Eagle shaft, and situated within the mining district of the relator.

That the shaft has been worked by the defendant, and he proposes to work it again in the usual manner and with a sufficient and the usual force of men; and—

That this shaft and mine and others with which it connects, contains standing gas in large quantities, deleterious to the health of the men, liable to be ignited, and by explosion to endanger their lives; and that such gas is suffered to be, accumulate and remain in the same, in contravention of the act of 3d March, 1870.

As indicated in the second foregoing paragraph, actual mining operations and the removal of coal from this shaft are temporarily suspended, and apprehending danger from resuming work, the Inspector of the district, under the alleged state of facts and condition of the mine, applies in accordance with the fifth section of the act for an injunction to prohibit the working of the same. No objection is taken in the facts that persons "are not now actually employed in working, or permitted to be for the purpose of working," &c., to the jurisdiction of the court in the premises, but by the consent and to avoid the danger and expense incident to the actual resumption of work, the question is raised whether under the bill and facts agreed upon and reported in the case, adequate ventilation, agreeably to the 7th section of the act of 3d March,

1870, P. D., 1618,07, has been provided, "to furnish sufficient pure air, to dilute and render harmless and expel the noxious poisonous gases to such an extent that the entire mine is in a fit state for men to work therein, and free from danger to the health and lives of the men by reason of said noxious and poisonous gases, and all workings kept clear of standing gas. In the language of the counsel for the parties, would it under the facts be lawful for the defendant to continue to cut and mine coal?

It appears that the mine at the points where workings have been, and are intended to be, carried on, is free from standing gas. It connects, however, as stated in the bill, underground, with extensive abandoned workings of old mines, belonging to and controlled by others than the defendant, where the roofs have fallen in, forming cavities—"graves," as they are technically called—in which inflammable gas accumulates, liable, from change of temperature, the barometic pressure of the atmosphere, to flow, or, by further fall of roof, to be driven, into the workings in this mine and there be ignited and cause destructive explosions.

It also appears that fresh air circulates through some of the old workings to the new, but whether through press and air-courses and in-take drifts, or simply through the abandoned chambers of old workings, (when the advantages of an increased supply of air are neutralized by the more ready transmission, these currents occasion of disengaged inflammable gas in the proper mixture with atmospheric air to become explosive,) does not appear either in the facts admitted or reported.

It is further stated, and the depositions are substantially to the same effect, that it is impracticable to close up the old workings, so as to disconnect them from the new, and that it would be impossible to force air enough down the Eagle shaft to expel from thence the standing gas, or in any other practicable manner to ventilate them. Considered in itself, and as to danger originating within its own limits, the ventilation of the Eagle shaft is in substantial compliance with the law. The dangers within, result from causes existing and having their origin without. It is assumed, and believed to be true, that the communication between the old and abandoned workings was made before the passage of the ventilation act, and before the precaution of keeping bore-holes twenty feet in advance of the face of the workings, when driving towards or approaching an abandoned mine, supposed to contain inflammable gas, or to be inundated with water, was enjoined in the 9th section as an imperative duty. But is it material to the present inquiry where the danger originated, if it actually exist? The act of Assembly deals with its presence, not its origin.

When the bill was presented it was said that the same state of facts existed and that the same questions would arise in the case of other mines, and it was, therefore, by consent, referred to Andrew Bryden, Esq., a gentleman of intelligence, practical experience and skill in mining, to examine into and to report upon the facts. The results reached in his report, as far as they relate to the present question, are, briefly,

First. That whilst in mines where large quantities of inflammable gas are generated it is practically impossible in literal compliance with the act, to keep both the old and new and all workings clear of standing gas, or of all accumulations of gas, in either larger or less quantities, but that it is practicable, under ordinary circumstances, to keep the working places tolerably secure from danger; and—

Second. That it is not safe to wall off or disconnect old workings, unless there be a shaft or opening sunk upon the highest point where the explosive gas, which is of less specific gravity than common air, can rise from the old workings to the surface and escape.

The evidence appended to the report, whilst sustaining these conclusions, establishes the farther fact that this mine cannot be kept clear of standing gas, or made to conform to the requirements of the Ventilation Law. The several witnesses, foremen, mine superintendents, and miners, who are familiar with or have examined the mine, concur in this view, as John Thomas, Henry Thomas, Thomas B. Williams, William Law; whilst E. Cartright, Walter Smiles, Henry Brown, George Carten, and John Thomas, in addition, particularize the danger of attempting to mine and remove the coal on the south-east side of the roll in the mines. This immediately connects with the old workings, and is understood to be the point where further operations are proposed.

The requirements of the law are not understood to be, as some of the witnesses seem to infer, that a mine shall be absolutely free from gas, for this, where its evolution is continuous, is obviously impracticable. The tenor and object of the act is, that by the introduction of pure air to the face of every working place and elsewhere throughout the mine, to dilute and render harmless and expel, to such an extent, that, by these several and joint means "the entire mine shall be in a fit state for men to work therein, and be free from danger to life and health." "All workings," says the act, "shall be kept clear of standing gas;" that is, as fast as evolved it is to be diluted, rendered harmless and expelled, and thus its accumulation, so as to fall within the designation of standing gas, to be avoided. This is possible, and this we understand the act to require.

Recurring, however, to the real question—"Is a mine 'free from danger,'" when its presence is admitted and shown to exist, merely because that danger, although distinctively manifesting itself within the mine, yet originates from causes located a few feet or yards beyond and outside the boundary line?

Is danger the less real because its removal is impracticable? The act recognizes no such distinction. It is entitled "An Act providing for the health and safety of persons employed in coal mines." Its provisions, prohibitions and penalties are directed to this end. The melancholy record of mining casualties in this and other coal fields, called for legislative protection. The application and enforcement of the law in a case where, from circumstances beyond the operator's control, compliance with its provisions is rendered impossible, may work hardship, but when the question is brought to the practical issue, is capital or human life to be sacrificed? can the answer be doubtful?

It is understood that the present and proposed workings are upon the south-east side of this saddle or roll in these mines. Against these, although not especially designated, the bill was filed, and to these alone this decision relates. Whether the coal may be mined on the north-west side of the roll safely and conformably to law, as intimated in the opinions of several of the experts examined, can be ascertained when the mining is attempted and its method and all the facts disclosed.

Upon careful consideration of the case presented, we are of the opinion that the operations, where and as they are conducted and proposed to be carried on, are not in conformity with the provisions of the act, and it is thereupon ordered that an injunction issue to prohibit the same until otherwise ordered.

LIST OF DEATHS *reported to the Inspector of the Eastern District of the Wyoming Coal Fields, Luzerne county, State of Pennsylvania, and the cause as shown by his investigation for the year ending 31st day of December, A. D. 1872.*

Date.	Names.	Age.....	Mar'd or sin-gle.....	Wife.....	Children.....	Colliery where accident occurred.	Date of investigation.....	Nature or cause of death.
Jan. 6...	John Murray.....	10	.....	....	.....	Tomkins colliery.....	Jan. 8.	Killed by being caught in the iron buckets of the elevator in breaker.
11...	David Lewis.....	32	M...	.....	1	Scranton slope & drifts	12...	Killed by a fall of top bench of bottom coal.
16...	Joseph Narey.....	10	.....	.....	.....	G. I. mines, Blakely tp.	17...	Killed by being run over by a locomotive that is used to run the mine coal cars from shaft to the breaker.
Feb. 2...	John Brannan...	50	M...	W..	1	Stark shaft.....	Feb. 3...	Killed by falling down the shaft.
7...	Anthony M'Hale	28	M...	W..	1	Tripp's slope, Scranton	8...	Died eight hours after being caught under a fall of coal from face of chamber.
9...	Thomas Durkin..	30	S....	.....	.. ..	Central shaft, Scranton	9, 10...	Killed instantly by a fall of coal out of face of his chamber.
13...	Michael Keife.....	35	M...	W..	6	Grand tunnel, Pittston	14...	Killed by a fall of top coal.
15...	Reese James.....	35	M...	W..	1	Pine shaft, Lackaw'na,	16...	Killed by falling down the shaft out of bucket. (Shaft new.)
21...	Michael Dyer.....	40	M...	W..	7	Green Ridge colliery...	22, 23...	Killed by a fall of rock roof in his chamber.
Mar. 4...	James Rodgers...	40	M...	W..	2	Meadow Brook colliery	Mar. 5...	Killed by a fall of top coal whilst mining with a pick in pillar.
8...	William Giles.....	21	M...	W..	.....	Waddel's shaft, Pitts'n	9...	Killed by a premature blast.
12...	John Young.....	13	.....	.....	.....	Roaring Brook shaft...	21...	Died on the 18th from being caught between a car and corner of pillar.
26...	Michael Carroll..	35	M...	W..	5	Dodge shaft.....	26...	Killed by a fall of roof.
26...	Patrick Finnerty	22	S....	.....	.....	Gipsy Grove colliery...	26...	Died from injuries received by a premature blast.
26...	George Maher....	12	....	.....	.....	Oak Hill colliery.....	28...	Killed by being run over by mine cars between No. 2 drift and breaker.
April 1...	Dwight Morse....	21	S....	.....	.....	Coal Brook breaker....	April 2...	Died from inju's rec'd by breaker being blown down by storm.
1...	John Clarke.....	20	S....	....	.....	Coal Brook breaker....	2.	Died from inju's rec'd by breaker being blown down by storm.
1...	William Palmer,	14	....	.....	.....	Coal Brook breaker....	2...	Died from inju's rec'd by breaker being blown down by storm.
1...	David Rosser.....	32	M...	W..	4	Lackawanna mines.....	2...	Killed by a fall of roof.
5...	Edw'd Sullivan..	35	M...	W..	3	Pine Brook shaft.....	6...	Died on the 16th from the effects of being burned by an explosion of fire-damp.
8...	Ant'y Campbell,	.....	S....	....	.....	Pine Brook shaft.....	8...	Killed—died in four hours after a fire-damp explosion, caused by going into their chamber contrary to the orders of fire boss.
26...	Thomas O'Hora..	.....	M...	W..	5	Pine Brook shaft.....	26...	Severely burned by an explosion of fire damp. He died eight hours after.
26...	W. H. Williams,	28	M...	W.	1	Hampton shaft.....	27...	Killed by concussion (died nineteen hours after) caused by an explosion of fire-damp.

May	1...	Michael Mooney	28	M..	W..	3	No. 2 slope, Jenkins tp.	Killed instantly by a fall of roof.
	1...	John Mooney.....	25	S..	.....	.....	No. 2 slope, Jenkins tp.	Killed instantly by a fall of roof.
	4...	Thos. Kennedy ..	45	M..	W..	5	No. 7 shaft, Jenkins tp.	Killed instantly by a fall of slate roof.
	8...	Michael Devine..	30	M..	W..	4	Central shaft	Killed instantly by falling down the shaft—about 200 feet.
	20...	Chas M'Andrews	35	M..	W..	3	Capouse or Briggs shaft	Killed instantly by a fall of roof.
	23...	James M'Quinn..	25	S..	....	.....	No. 8 shaft, Pittston....	Killed instantly by a fall of roof.
	27...	George Mellon ...	34	M.	W.	5	Rough and Ready shaft	Killed—he was coming up the shaft when the carriage got caught, throwing him to the bottom of the shaft.
	31..	Teddy Langan...	.....	....	.. ...	.....	No. 8 shaft, Pittston....	Killed by fall of roof.
	31...	Edward Barrett..	13	Door boy.			Taylor mines, Lacka'a	Severely injured by being run over by cars in the mine—pan of knee off. He died in five days after the accident occurred.
June	7...	Henry Woods.....	53	M..	W..	9	Meadow Brook colliery	Killed by examining a blast and it went off when doing so.
	22...	Michael M'Hale,	.....	M..	W..	6	Gipsy Grove colliery...	Injured seriously by being caught by fall of coal—died on 25th.
	25...	Frank Rooney ...	24	S...	.....	.....	Scranton slope & drifts	Injured seriously by being caught by a fall of black rock roof—died next day.
	25...	D. R. Pritchard ..	23	S...	.....	.....	No. 1 Diamond shaft ...	.... Injured whilst taking down some top coal; the bar he had in his hand hit him in the abdomen and he died next day from his injuries.
	25...	James O'Boyle...	15	S...	.....	.....	Stafford colliery..	Injured (died same evening) by falling down a trestle outside, 18 feet high, on the L. and S. R. R.
July	2...	Joseph Edwards	33	S...	....	.....	Ontario colliery.	July 3... Killed by a premature blast.
	3...	John Martin	25	M..	W..	1	Oxford colliery..... .	11... Died from the effects of being injured by a fall of roof. NOTE—I went to the mines three times before I could get any testimony in this case, as the mines were idle and there was no person to give evidence.
	19...	Michael Ford.....	18	S...	.....	.....	Stark colliery	22... Killed instantly by a fall of rock.
Aug.	6...	John Gilgallon...	47	M..	W..	2	No. 1 slope, Olyphant..	Aug 7... Killed instantly by a premature blast.
	10...	Thomas Lloyd...	12¾	.....	....	.....	Von Storch colliery	12... Killed—supposed to be opening his door when he was hit by a trip of cars coming down a grade in the mines.
	24...	Howel Edwards,	21	S...	.....	.....	Tomkins shaft	26... Seriously injured by getting knocked against the rib in the mines; he died from his injuries on the 27th. There was a fire-damp explosion and he was knocked by the concussion.
	29...	Hugh Harmick..	69	M..	W..	4	Grassy Island breaker,	30... Killed instantly by a run-away car on the breaker plane as he was crossing the track at the foot.
Sept.	6...	Thomas O'Boyle	27	M	W.	1	No. 10 shaft, Pittston...	Sept. 7... Seriously injured by a fall of roof—he died on the 13th.
	9...	Michael Roach...	45	M..	W..	4	No. 2 slope, Diam'd ms.	12... Killed by being shot from a blast which was fired in the next chamber. He was standing for protection in his chamber opposite where the blast was fired.
	13...	Patrick M'Cue ...	32	M .	W..	1	Mt. Pleasant colliery..	13.. Killed by a fall of roof coal.
	14...	Patrick Reap.....	34	M..	W..	4	M. N. A. Coal Co	14 . Killed by a fall of top coal.
	24...	James Lynott.....	15	....	.....	.....	Columbia tun., Pitts'n,	26... Died on the 25th from injuries received whilst driving in the mines on the 24th. He went to the face of a chamber and was caught under a fall of coal.

List of Deaths in Eastern District of Wyoming Coal Fields—*Continued.*

Date.	Names.	Age.....	Mar'd or single..	Wife	Children	Colliery where accident occurred.	Date of investigation	Nature or cause of death.
Sept. 27...	Peter Gray.....	30	M..	W..	2	Grand tunnel, Pittston	Sept 28...	Killed by a fall of roof.
Oct. 3 ..	John M'Glynn...	16	....	.....	.....	No. 2 dip mines, Olyp't	Oct. 7...	Killed by a piece of coal from a blast.
9...	Patrick Maloney	45	M.	W .	2	Hyde Park shaft	9...	Killed by being hit with a piece of coal from a blast.
16...	Thomas Keane...	40	M.	W..	6	S. C. Co.'s slope & drift	17...	Killed instantly. } These two were broth-
16...	Owen Keane	31	S...	....	....	S. C. Co.'s slope & drift	17...	Died 1 hour after they got him home. } ers, working in the same place together when they were caught under a fall of top coal and roof. They were notified of the place being dangerous by the fire boss five minutes and by the mining boss ten minutes before the fall came but did not heed it.
24...	Thomas Mallot...	33	M..	W..	1	Dodge shaft, Lack'a tp.	25..	Fell dead whilst in the act of filling a car of coal in the mines. There was a coroner's inquest held and they rendered a verdict, "died of heart disease."
24...	John Swift.....	16	S...	...	.....	Ontario colliery	26...	Leg cut off by a car running over him; he died the same evening. He was the only support of a mother and six children.
25...	Thomas Dunlap..	32	M..	W..	3	Twin shaft, Pittston....	26...	Killed instantly by a fall of black rock.
25...	Martin Gilboy....	43	M..	W..	1	Dodge shaft.....	28...	Died from the effects of injuries received by a fall of slate roof which runs between the top and rider coal.
Nov. 13...	Robert Graham ..	29	M..	W..	2	Stark shaft colliery	Nov. 14...	Killed instantly by a fall of black rock that runs between the top and bottom benches of coal.
14...	Thomas Crosby ..	29	M..	W..	3	Hampton mines.....	15...	Killed by a fall of roof.
16...	Richard Gibbons	30	M	W..	1	No. 10 shaft, Pittston...	18...	Killed by a fall of roof in the 14-feet vein. } Both killed at same
16...	Michael Powers..	43	M..	W..	5	No. 10 shaft, Pittston...	18...	Killed by a fall of roof in the 14-feet vein. } time & same place.
Dec. 6...	Oscar Williams ..	27	S...	....	.. .	Corey's breaker.....	Dec. 9...	Killed by being caught between mine cars outside at breaker-head.
12...	Thos. Hopkins...	40	M..	W..	3	Central shaft.....	13...	Killed—he was taking props from under the top coal when it fell on him, killing him instantly.
13...	Patrick M'Hale..	28	M..	W..	1	Eaton & Co.'s mines ...	14...	Killed by a fall of roof, (bony coal.)
17..	Thos. Queeney...	35	S...	....	.....	Enterprise colliery.....	18...	Killed by a fall of coal whilst mining under it.
20...	Thomas Hines...	14	.....	.....	...	No. 10 shaft, Pittston...	21...	Killed whilst riding on a loaded car on a slope in the mines.

NOTE.—There were 6,560,450 tons of coal mined in this district in the year 1872. There were 67 deaths, which would give 97,917 tons of coal mined for every death.

NATURE OF DEATH.

There were killed by breaker machinery	1
Do.....do....locomotive	1
Do.....do....cars	5
Do.....do....falls of coal	17
Do.....do....falls of roof	15
Do.....do....falls of rock	4
Do.....do....premature blasts	7
Do.....do....falling down shafts	4
Do.....do....breaker being blown down	3
Do.....do....falling off trestles	1
Do.....do....explosions of fire-damp	3
Do.....do....concussion of fire-damp	2
Fell dead in mines	1
Died from injuries received by cars	3
Total	67

LIST OF ACCIDENTS *reported to the Inspector of the Eastern District of the Wyoming Coal Fields, Luzerne county, State of Pennsylvania, and the cause as shown by his investigation for the year ending 31st day of December, A. D. 1872.*

Date.	Names.	Age.....	Mar'd or single.	Wife.....	Children.....	Colliery where accident occurred.	Date of investigation	Nature or cause of accident.
Jan. 16...	John Nash.....	37	M..	W..	2	Scranton slope and drifts,	Jan. 17...	Injured by a fall of top bench of bottom coal.
19...	Patrick Golder.	12	.....	.....	.....	R. Brook shaft, Dunmore,	24...	Injured by a car running over his leg in mines, breaking it.
23...	James M'Nash ...	.....	....	.....	.....	Leggitt's Creek shaft.....	27...	Injured by a piece of coal falling down the shaft and hitting him.
24...	James Tighe	.....	....	.....	.....	White Oak mines..	26...	Injured by a fall of coal in the face of his chamber.
26...	Hugh Williams..	42	.....	.....	.....	Scranton slope and drifts,	27...	Injured by a fall of coal in the face of his chamber.
26...	Michael Mahon ..	24	S...	...	.....	Bellevue shaft.....	27...	Injured severely by a fall of coal off the side of main traveled road.
31...	Patrick Callahan	.....	M..	....	.....	Leggitt's Creek shaft.....	Feb. 5 ..	Leg broken in two places by a fall of roof.
Feb. 3...	Mich. M'Donald,	.....	.....	.....	.....	Eaton & Co.'s mines, Arch.	6...	Leg broken by being caught by a car in mines.
3...	David Jenkins ...	.....	....	....	.....	Grassy Island shaft	6...	Injured (not seriously) by a fall of coal and rock.
3...	David Jenkins ...	.....	....	....	....	Grassy Island shaft	6...	Injured (not seriously) by a fall of coal and rock.
8...	Thos. Higgins.....	....	.....	.....	....	No. 10 shaft, Pittston.....	.....	Injured—(not seriously) jammed between two cars in the mines.
9...	James Conway...	.....	.....	....	.....	Coal Brook mines.....	12...	Injured severely by an explosion of powder whilst making cartridges.
19...	James Grady.....	.....	.....	.....	.....	Jermyn's slope.....	20...	Eyes and face burned by a premature blast.
20...	Peter Hughes	.....	.....	...	.....	Jermyn's shaft.....	21...	Both legs broken by a car running over him in the mines.
20...	Rich'd Edwards..	.....	.....	...	....	Gipsy Grove colliery.....	22...	Burned by an explosion of powder whilst making a cartridge.
26...	John Niles.....	.....	....	.....	....	Pine Brook shaft.....	26...	Burned by an explosion of fire-damp in chamber.
Mar. 2...	Thomas Allen. ..	.....	.....	.....	.....	Pine Brook shaft.....	Mar. 4 ..	Burned by an explosion of fire-damp in chamber.
2...	H. Fergusson	.....	.....	. ..	.....	Pine Brook shaft.....	4...	Burned by an explosion of fire-damp in chamber.
4...	Wm. Muldoon...	....	.....	.....	.....	Meadow Brook colliery..	5...	Injured by a car in the mines, (not serious.)
7...	Patrick Hurley ..	.....	.....	.....	.....	Grassy Island shaft.....	7...	Injured by being caught under hoisting carriage in shaft.
8...	E. J. Williams...	45	M..	W..	2	Bellevue shaft.	8...	Injured by a premature blast—caused by a blower catching fire.
8...	Charles Davis.....	.....	.....	.....	.....	Leggitt's Creek shaft.....	8...	Injured by a fall of roof.
8 ..	Henry Adams....	.....	.....	.. .	....	Waddel's shaft, Pittston..	9...	Injured by a permature blast, (not seriously.)
12...	John Williams...	50	M..	W..	6	Mount Pleasant slope.....	13...	Both legs broken by falling down a new air shaft.
15..	John W. Lewis ..	35	M..	W..	3	Dodge shaft, Lackawan'a	16...	Leg broken by a fall of top coal.
16...	Joseph Lloyd	.....	.....	.....	....	Capouse or Briggs shaft....	18...	Leg broken by a fall of rock roof.
23...	Mich. Finnerty..	14	.....	.....	.....	Gipsy Grove colliery.....	25...	Severely injured by a kick from a mule.

Mar.	26...	Step'n Finnerty,	17	S.	.....	.....	Gipsy Grove colliery...	Mar. 26...	Severely injured by a premature blast.
	28...	George Penman,	12	.....	.....	.....	No. 1 slope, Olyphant..	29...	Leg broken by being caught between the cars.
April	1...	J. M'Loughlin...	20	S...	.....	....	Coal Brook breaker.....	Apr. 2...	Injured by falling from top of breaker when blown down with a storm.
	2...	T. T. Watkins....	.....	.....	.....	.....	Capouse mines.....	3...	Leg broken by a fall of rock roof.
	3...	Lewis R. Evans..	35	M..	.....	.....	Oxford shaft	4...	Arm broken by a fall of rock roof.
	5...	Anthony M'Hale		M..	.....	.....	Pine Brook shaft.	6...	Slightly burned by an explosion of fire-damp.
	5...	John Niles.....	.....	S...	.....	.....	Pine Brook shaft.....	6...	Slightly burned by an explosion of fire-damp.
	5...	P. Stanton, door	boy	S...	.....	.....	Pine Brook shaft.....	6...	Injured by concussion caused by a fire-damp explosion—caused by going into his chamber contrary to orders of fire-boss.
	8...	Patrick O'Hora...	.....	S...	.....	.....	Pine Brook shaft....	8...	Slightly injured by an explosion of fire-damp—caused by going into his chamber contrary to orders of fire-boss.
	8...	James Stone	.....	.....	.....	.....	Pine Brook shaft.....	8...	Slightly injured by an explosion of fire-damp—caused by going into his chamber contrary to orders of fire-boss.
	9...	Wm. M. Clarke..	....	.....	.....	.....	White Oak colliery	9...	Slightly injured by a fall of top coal.
	9...	James Basten.....	24	M..	W..	.....	Central shaft	12...	Seriously injured internally by a fall of top coal.
	11...	William Cadden		S...	.....	.....	Grassy Island shaft	13...	Leg broken by a fall of top coal.
	13...	James M'Hale....	20	S...	.....	.....	No. 3 slope, Olyphant..	15...	Severely burned by powder whilst making cartridges.
	16...	Philip Pryor	35	M..	.....	....	Central shaft	20...	Severely burned by a premature blast.
	16...	James Brown.....	26	S...	.....	.....	Central shaft	20...	Slightly burned by a premature blast.
	17...	Robert Lyons ...	.....	.....	.....	.....	No. 1 slope, Olyphant.	19...	Slightly injured by a premature blast.
	17...	James Jones	48	M..	W..	8	Archbald shaft	22...	Seriously injured internally by being run over by car in mines.
	23...	John Lenton.....	45	M..	W..	3	No. 10 shaft, Pittston...	29...	Leg broken and severe internal injuries by a fall of top coal.
	23...	Mich. Fenaghty..	.....	.....	.....	.....	No. 10 shaft, Pittston...	29...	Severely, but not seriously, injured by a fall of top coal.
	23...	Mich. O'Malia....	.....	....	.....	.....	No. 10 shaft, Pittston...	29...	Slightly injured by a fall of top coal.
	23...	Alfred Hale.....	14	boy	.....	.....	Bellevue shaft breaker,	May 3...	Leg broken, outside, between large railroad car and timber.
	24...	Patrick Fleming.		.....	.....	.....	Roaring Brook shaft ...	....	Slightly injured by a fall of roof.
	24...	John M'Donell...	.....	.....	.....	.....	Gipsy Grove colliery...	....	Slightly injured by being run over by a car.
	24...	Simon Jones.....	.....	.....	....	.....	No. 6 sh'ft, Jenkins tp.,	Apr. 23...	Leg broken by a prop falling on it.
	26...	Thomas Allen....	.....	M..	.....	.....	Pine Brook shaft.....	26...	Burned by an explosion of fire-damp, not seriously.
	26...	Larry Kerins.....	.....	M..	.....	.....	Pine Brook shaft.....	26...	
	26...	Henry Strong.....	....	M..	....	.....	Pine Brook shaft.....	26...	
	26...	Dennis Nealon...	.....	M..	....	.....	Pine Brook shaft.....	26...	
	26...	John Read	31	M..	W..	5	Hampton shaft.....	27...	Seriously injured by an explosion of fire-damp in the mines.
	26...	Thomas Barrow..	65	M.	W..	3	Hampton shaft.....	27...	Note.—The mines were idle for five months, and when last worked never used safety lamps.
	26...	Wm. Morgan.....	65	M..	W..	.....	Hampton shaft.....	27...	Slightly burned.
	30...	Francis Morrow..	....	. ..	.....	.....	Eaton & Co.'s mines....	30...	Arm broken by a fall of coal.
May	2...	James Gennesy..	.....	.....	.....	.....	White Bridge tunnel...	May 2...	Severely injured by a fall of roof.
	3...	Thos. Kennedy ..	.....	.....	....	.....	White Bridge tunnel...	6...	Severely injured by a fall of roof.
	6...	Barney Gilas	.....	.....	....	.....	Grassy Island shaft	6...	Head and shoulders injured by a fall of coal—not serious.
	7...	James Durkin ...	26	S...	..	.....	Hampton shaft mines..	7...	Seriously injured by a fall of roof—head and shoulders crushed.
	7...	Patrick Malia.....	45	M..	W..	4	Scranton slope & drifts,	8...	Leg broken by coal falling out on it from face.

List of Accidents—*Continued.*

Date.	Names.	Age	Mar'd or single	Wife	Children	Colliery where accident occurred.	Date of investigation	Nature or cause of accident.
May 7...	Patrick Gillespie	.....	.....	.....	....	Jefferson tun'l, Fell tp.,	May 10...	Hit by a piece of coal from a blast—not serious.
7...	Francis Foster ...	14	.....	.....	.....	Coal Br'k tun'l, Fell tp.,	10...	Leg broken by a runaway trip in the mines.
7...	A. M'Dermott....	14	.....	.....	.....	Jefferson tun'l, Fell tp.,	10...	Injured by being thrown off his mule whilst going to work.
10...	John O'Hora.....	.....	.....	.....	.....	No. 2 shaft, Dunmore..	11...	Hand caught between the cars in mines—not serious.
10...	William Ellis.....	16	.....	.....	.....	Diamond mines.....	13...	Car ran over his arm, breaking it.
13...	Robert Shaw.....	32	S...	....	.....	Oxford shaft	16...	Leg broken (in two places) below the knee by a fall of rock.
14...	D. Parry, (boy,)	.....	.....	....	.....	Mt. Pleasant colliery...	15...	Injured by being run over by a car—not serious.
14...	James Pryor	.....	.....	....	.....	Jermyn's mines.....	17...	Leg broken—got hit with a piece of coal from a premature blast.
15...	John Brannon ...	Dri	ver,	.....	.....	Valley tunnel, Fell tp.,	18...	Leg broken—got caught between two cars in the mines.
16...	Frank Webster..	Dri	ver,	.....	.....	Cayuga shaft	16...	Shoulder blade broken by car in mines—not serious.
24...	P. Haley, (boy,)	.....	.....	.....	.....	No. 3 slope, Olyphant..	28...	Jammed between a trip of loaded cars and the rib in the mines.
28...	Wm. M'Hale.....	18	S...	.....	....	Scranton slope & drifts,	29...	Severely bruised in loins and thighs—caught by the cars in mines.
28...	Daniel Reese.....	34	M..	W..	.....	Dodge shaft	29...	Leg broken by a premature blast—caused by fire-gas blower igniting.
28...	Thomas Healy...	.....	.....	.....	.....	Gipsy Grove colliery...	31...	Leg broken by a fall of roof.
28...	John M'Hale.....	.....	.....	.....	....	Gipsy Grove colliery...	31...	Slightly injured by a fall of roof.
June 1...	Evan Thomas.....	.....	.....	.....	.....	Grassy Island shaft.....	.....	Injured by a fall of rock roof.
5...	Anthony Boose ..	.....	.....	.....	.....	Butler shaft, Pittston ..	June 7...	Leg broken by a piece of coal from blast.
7...	John O'Boyle.....	14	.....	.....	.....	Bellevue slope	11...	Injured by being run over by a car in the mines.
8...	Bryan Manghan,	.....	.....	.....	.....	Bellevue slope	11...	Injured by being knocked down by a car in the mines.
10...	Thos. P. Moran...	15	.....	....	.....	National mines.....	13...	Injured—was caught between the traces of the mule and car.
10...	Michael Weable,	28	S...	....	.....	Taylor shaft.....	13...	Injured by a fall of roof—not serious.
18...	John Jones	35	M..	W..	2	Cayuga shaft.....	19...	Injured by a fall of rock roof in heading.
19...	John W. Reese...	59	M..	W..	7	Continental mines	20...	Injured (seriously) by a prop falling on him and hitting him on the head.
22...	Peter Naughton..	20	S...	.....	.....	Cayuga shaft.....	22...	Injured (seriously) by being caught by a fall of top coal.
28...	James Connelly..	14	.....	.....	.....	Bellevue slope.....	July 1...	Leg broken by being caught between the end of stretcher stick and building outside, at the boiler house of slope.
July 5...	John H. Davis ...	15	.....	.....	.....	Bellevue sh't, Scrant'n	8...	Injured by being kicked by a mule.
5...	Micha'l Conners,	14	S...	.....	.....	Bellevue slope	9...	Injured by being kicked by a mule.
8...	John Conway.....	16	.....	.....	.....	Tripp's slope.....	9...	Arm broken by falling under a car.
8...	John Donnelly...	.....	.....	.....	.....	Grassy Island shaft.....	10...	Injured by fall of roof.

July	15...	John Coolican....	.....	.....	.....	.....	Eaton & Co.'s m., Ar'd	July	18...	Seriously injured by a fall of top bony coal.
	16...	Thomas Connor..	.....	.....	.....	.....	White Bridge tunnel ..		18...	Injured (not seriously) by a fall of top coal.
	16...	John H. Jones...	35	M..	W..	3	Leggitt's Creek shaft ..		20...	Leg broken by a fall of top bony coal.
	16...	Alex. Grogan.....	17	.....	.....	.....	Tripp's slope		19...	Foot crushed in cog-wheels of mule pump in the mines.
	16...	Andrew Cullen..	.....	.....	.....	.....	Stafford mines breaker		22...	Arm broken—got caught whilst coupling cars at the schutes.
	17...	Frank Dunston..	20	S..	....	.....	Nat'l Anthracite mines		19...	Arm broken by a fall of roof in main gangway.
	19...	Wm. M'Coy.....	29	M.	.....	.....	Pine Brook shaft.....		20...	Foot crushed in cog-wheel of mule pump in the mines.
	30...	John Flynn.....	.....	.....	.....	.....	Roaring Brook shaft ...		31..	Injured (not seriously) by a fall of roof.
	30...	James Judge.....	.....	.....	.....	.....	Ravine shaft	Aug.	5...	Leg broken by a fall of black rock roof.
Aug.	2...	Thomas Jones....	14	.....	.....	.....	Continental shaft		3...	Leg fractured at ankle—run over by a car in the mines.
	3...	John S. Morgan,	43	.....	.....	.....	Cayuga shaft		5...	Injured (not seriously) by falling down shaft, 158 ft., to sump.
	5...	Mich. Donnelly..	.....	.....	.....	.....	Grassy Island shaft.....		7...	Injured (not seriously) by a fall of roof. } Same place.
	5...	Wm. Lawler.....	.....	.....	.....	.....	Grassy Island shaft.....		7...	Injured severely by a fall of roof. }
	7...	Jas. R. Price	38	M..	W..	5	Taylor shaft.....		8...	Injured seriously by a fall of top coal.
	7...	James Judge	15	.....	.....	.....	Archbald shaft		8...	Foot crushed (amputated)—caught in cog-wheels of braker.
	8...	Jno. Bambauch..	.....	.....	.....	.....	No. 2 breaker, Dunm'e		9...	Slightly injured by cars at breaker.
	10...	James Rodgers...	.....	.....	.....	.....	Tomkins shaft		10...	Injured by a premature blast.
	13...	And. Gillespie...	15	.....	.....	.....	Meadow Brook coll'y..		14...	Slightly injured—had hand and foot caught between the cars.
	13...	Wm. Lloyd.....	.....	.....	.....	.....	Continental mines		13...	Both severely injured by a blast fired in the next chamber,
	13...	Thos. Hopkins...	.....	.....	.....	.....	Continental mines		13...	blowing the coal through the rib. They got no notice.
	14...	John Evans.....	12	.....	.....	.....	Butler Shaft mines.....		16...	Severely injured—was caught between car and prop in mines.
	15...	Frank Sweeny...	.....	.....	.....	.....	Mount Pleasant mines,		15...	Arm broken whilst unhitching mule on column dump—mule started when he was doing so, drawing a car over his arm.
	21...	Wm. Lurney.....	16	.....	.....	.....	Oxford shaft		22...	Arm broken whilst unhitching mule—he started, which threw him on the track, the car running over his arm.
	24...	Thos. Lyons	.....	.....	.....	.....	Seneca slope, Pittston,		26...	Injured by a fall of roof.
	24...	William Jones...	.....	.....	.....	.....	Tomkins shaft		26...	Burnt by an explosion of fire-damp.
	24...	Thos. Pointon....	.....	.....	.....	.....	Tomkins shaft		26...	Injured by concussion—got knocked down.
	24...	Samuel Monk.....	.....	.....	.....	.....	Tomkins shaft		26...	Slightly burnt by fire-damp.
	24...	Thos. B. Evans..	.....	.....	.....	.....	Tomkins shaft		26...	Slightly burnt by fire-damp.
	24...	John Hughes.....	.....	.....	.....	.....	Tomkins shaft		26...	Slightly injured by concussion. The men injured by this and the four preceding accidents were working at the sump when the explosion took place. The mine was examined by the fire-boss a short time before at the face of the workings.
	31...	Thomas Culkin..	36	M..	W..	7	Tripp's slope		31...	Injured by a fall of roof.
	31...	Thomas Allen....	.....	M..	.....	....	Meadow Brook coll'y..		31...	Leg broken by a premature blast.
Sept.	2...	Wm. Williams...	.....	.....	.....	.....	No. 3 shaft, Carbondale	Sept.	3...	Severely inj'd between a car and a pillar at mouth of chamber.
	4...	Robert Davis.....	30	S..	.....	... .	Bellevue sh., Lack. tp.		4...	Severely injured whilst in the act of lifting a car on the track, the lever breaking and one part of it hitting him on the head.
	4...	L. Wisicanon.....	.....	.....	.....	.....	No. 8 shaft, Pittston....		.....	Severely injured by being kicked by a mule—not serious.
	7...	Mart. Flannery ..	.....	.....	.....	.....	Sawyer's tun., G. G. C.		10...	Seriously injured by a fall of roof.
	9...	Thomas Lynott ..	.....	.....	.....	.....	Lackaw'a tun., Carb'e.		23...	Severely injured—went back to see if his shot missed fire—it went off and hurt him.

List of Accidents—*Continued.*

Date.	Names.	Age.....	Marr'd or single...	Wife.....	Children	Colliery where accident occurred.	Date of investigation.	Nature or cause of accident.
Sept. 9...	Michael Finnan..	.....	.....	.....	.....	Breaker tun., Carbon'e	Sept 23...	Severely injured by falling in front of two loaded mine cars.
10...	Thos. Francis.....	.....	.....	.....	.....	S. C. Co.'s slope & drifts	10...	Severely injured by a fall of roof.
13...	Hugh M'Lean.....	.....	.....	.....	.....	No. 2 shaft, Dunmore..	10...	Leg slightly injured by a mine car jumping the track.
14...	Thomas Jenkins,	.....	.....	.....	.....	L. C. shaft, Providence	15...	Slightly injured by an explosion of fire-damp.
19...	Rich'd J. M'Hale	.....	.....	.....	.....	Dip mines, Olyphant...	19...	Severely inj'd by an explos'n of powder in a keg whilst handling it, as he was changing powder from one keg to another.
20...	Cornelius O'Neil	.....	.....	.....	.....	Grand tunnel, Pittston	28...	Leg broken by a fall of top coal.
21...	A. Walsh, (boy)	.....	.....	.....	.....	M. A. Coal company ...	28...	Leg broken—he was riding on a car—he fell in front of it and was run over.
21...	Thomas Boland..	.....	.....	.....	.....	Ravine shaft, Pittston..	25...	Leg mashed by a fall of coal and rock.
24...	John M'Carthy ..	Door boy.		.....		Von Storch slo., Prov'e	24...	Severely injured by loaded cars running against him whilst opening his door.
30...	J. Mahony (boy)	.....	.....	.....	.....	Bellevue sh., Lack. tp.	Oct. 2...	Severely injured whilst riding on top of a car loaded with wooden rails.
30...	John Waughten,	.....	.....	.....	.....	No. 3 drift, M. B. col'y	2...	Severely injured whilst running a car down his chamber.
30...	Lewis Dearing...	.....	.....	.....	.....	Coal Brook tun., Carb'e	12...	Severely injured by being caught under a fall of roof.
Oct. 2...	Michael Walsh...	.....	.....	.....	.....	Eaton & Co.'s m., Arch.	11...	Severely injured by a fall of top coal.
3...	Michael Kane....	.....	.....	.....	.....	No. 1 drift, M. B. coll'y	11...	Severely injured by running a car down his chamber.
4...	John R. Harris...	45	.....	.....	.....	Bellevue shaft	9...	Severely injured by a fall of roof when standing a prop.
6...	Pat'k Sheridan..	.....	.....	.....	.....	Ravine shaft, Pittston,	10...	Severely injured by running against his needle when going away from a blast.
6...	Thomas Jones....	.....	.....	.....	.....	Ravine shaft, Pittston,	10...	Leg broken by a car jumping the track.
7...	John Duggan.....	.....	.....	.....	.....	Powderly slope, Carb'e	10...	Slightly injured by a premature blast.
7...	Martin Duggan ..	.....	.....	.....	.....	Powderly slope, Carb'e	10...	Slightly injured by a premature blast.
12...	John Kenvin.....	37	M..	W..	4	Oxford shaft, H. Park..	15...	Severely injured by a fall of roof.
12...	Patrick Calpin...	30	.....	.....	.....	Dodge shaft, Lack. tp..	15...	Slightly burnt by an explosion of fire-damp.
18...	Anthony Duffy..	.....	.....	.....	.....	Coal Brook tunnel	None.....	Slightly injured by a fall of slate.
18...	T. Harrington.....	.....	.....	.....	.....	Von Storch mines.....	None.....	Slightly injured by a fall of coal and rock.
19...	John Keife.....	12	.....	...	.....	Ontario colliery	Oct. 21...	Leg and arm broken, and other severe injuries by being caught between a loaded car on which he was riding and the abutment of bridge over the mine railroad close to the breaker.
23...	David J. Thomas	.....	.....	.....	.....	Capouse or Briggs shaft	23...	Injured by a fall of roof—not serious.
25...	Thos. Howard.....	17	.....	.....	.....	Oxford shaft, H. Park.	31...	Severely injured by falling down the shaft about twenty feet.
27...	Chas. Hoofman...	23	S...	.....	....	No. 4 Rolling Mill drift	20 ..	Severely burned by an explosion of powder by a spark falling from his lamp into the keg which was about one-third full.

Nov.	2...	John Kelly.....	19	S....	.....	....	No. 2 shaft, 14 foot Diamond vein.	Nov. 2...	Severely injured—shoulder blade broken by a car running over him in the mines; he tried to sprag the car but his foot slipped; he fell before it.
	2...	James Toole.....	15	.....	.....	.....	Oxford shaft, H. Parke	4...	Knee seve'ly inj'ed—caught between bumbers of two mine cars.
	2...	Anthony Barrett	.....	....	....	....	N. A. C. Co.'s mid. drift	4...	Arm broken by premature discharge of blast.
	2...	Peter Lynott.....	.....	.....	.....	.....	Leggitts Creek shaft...	6...	Severely injured in the spine by a fall of roof.
	6...	Charles Price.....	15	.....	.....	.....	Leggitts Creek breaker	7...	Arm broken—fell into one of schutes whilst working in breaker.
	8...	Thomas Francis..	30	M...	W..	1	Scranton C. Co.'s mines	8...	Arm broken by a fall of slate roof—he was unloading a car some distance down from the face of the chamber when a piece of slate fell down on him whilst he was inside the car.
	8...	James Moran.....	.....	.....	.....	.....	Scranton C. Co.'s mines	9...	Severely injured whilst he was lowering a car down his chamber with a rope tackle; his foot was severely injured.
	8...	Thomas Preston..	.....	.....	.....	.....	Gipsy Grove colliery...	9...	Injured by falling before a car outside the mines whilst trying to get on. [to be carelessness.
	9...	Dennis Grimes...	.....	.....	.....	... .	No. 2 Diam'd shaft, 14 ft.	11...	Leg fractured by a fall of coal whilst working under it; seems
	9...	Barth'w Walsh...	.....	.....	.....	.....	Capouse or Briggs shaft	12...	Severely injured in the head—went away from a blast and was in the act of putting his head out of the cross entrance when a piece of coal hit him on the head injuring him severely.
	11...	John A. Jones....	15	.....	....	.....	Continental shaft.....	13...	Skull fractured by a kick from a mule.
	12...	John Collins	.....	....	.....	.....	No. 10 shaft, Pittston...	16...	Leg broken by a fall of black rock roof.
	14...	Jenkin Jenkins..	30	M...	W..	... .	Hampton mines.....	15...	Injured at the same time by the same fall of roof as Crosby was.
	14...	John Connell.....	.....	.....	.....	.....	Ravine shaft	16...	Injured by a fall of roof whilst in the act of standing a prop.
	14...	James Manley ...	16	....	.....	.....	No. 2 slope, Jenk's tp.	16...	Leg broken whilst unhitching his mule when the cars were in motion; he fell in front of it; it run over him breaking his leg.
	21...	George Patten....	.....	.....	....	.....	No. 1 drift, Olyphant...	25...	Injured by an explosion of powder.
	22...	Thos. Finnigan...	.....	.....	....	.....	Coal Brook mines.....	25...	Severely injured by a fall of coal roof.
	27...	Stephen Gavin...	.....	.....	.....	.....	Powderly slope, Crb'e,	29...	Injured by getting squeezed between the heading wall and loaded cars; he will recover.
Dec.	4...	James Early	.....	.....	.....	.....	Enterprise colliery.....	.....	Injured by a fall of rock roof.
	4...	M. Loughney.....	.....	.....	.....	.....	No. 10 shaft, Pittston...	.....	Arm broken by a fall of coal.
	5...	Michael Gebbons	boy	.....	.....	.....	Eaton & Co.'s breaker,	.....	Leg cut off by a large railroad car on the D. and H. C. Co.'s loaded track whilst going to dinner from the breaker; it is not really a mine accident, and ought not come under the law.
	6...	James Kearns.....	.....	.....	....	.....	Lackawanna tunnel....	Dec. 9...	Injured by a fall of roof; ankle dislocated; face cut.
	9...	Jacob Fisher.....	34	S....	.....	.....	No. 2 Diam'd shaft, 14 ft.	9...	Slightly injured by an explosion of fire-damp; he went into a chamber marked five and got burned.
	9...	John Barrett.....	14	.....	.....	.....	National Anth'e ms.....	.....	Slightly injured by an empty car.
	10...	Henry Campbell	14	.....	.....	.....	No. 2 Diam'd shaft, 14 ft.	11...	Leg broken by a mule falling on him.
	12...	Michael Tobin ...	45	M...	W..	4	Central shaft	.....	Seve'ly inj'ed—was working with Hopkins when he got killed.
	13...	James Bourke ...	Door boy.			...	Leggitts Creek shaft...	13...	Lost one finger by riding on a loaded car in the mines.
	23...	Mat'w Phillips...	58	M...	....	.....	Hampton mines..... ...	....	Severely injured by a fall of roof.
	26...	George Martin ...	.....	.....	.....	....	No. 7 shaft	27...	Slightly injured by an explosion of fire-damp.
	26...	John Bourke.....	60	M...	W..	2	No. 7 shaft	27...	Leg broken by a fall of roof—died January 5, 1873.

The amount of coal mined in the year 1872 was 6,560,450 tons. There was 97 917 tons mined for every death; 55,129 tons mined for one orphan; 172,643 ton mined for each widow; and 35,082 tons mined for each accident.

Nature of Accidents.

There were injured by falls of coal	2
Do.....do.....falls of roof	4
Do.....do.....cars in mines	4
Do.....do.....fire-damp explosions	2
Do.....do.....powder explosions	
Do.....do.....premature blasts	2
Do.....do.....hoisting carriage	
Do.....do.....falling down the shaft	
Do.....do.....mules	1
Do.....do.....props	
Do.....do.....cog wheels in mines	
Do.....do.....falling off breaker	
Do.....do.....outside cars	
Do.....do.....breaker machinery	
Total	18

Note.—There were thirty-seven persons had their legs broken, and thirteen persons had their arms broken; these are included in the above list.

CONDITION *of Mines of the Eastern District of the Wyoming Coal Fields, Luzerne county.*

Number of colliery or mines	Name of colliery or mine.	Township, city or borough where located.	By whom operated.
1	No. 2 or Port Griffith	Jenkins township	Pennsylvania coal company.
2	Everhart colliery	do	Everhart & Co.
3	No. 6 shaft colliery	do	Pennsylvania coal company.
4	No. 5 shaft colliery	do	do.
5	No. 11 shaft colliery	do	do.
6	No. 7 shaft colliery	do	do.
7	No. 4 shaft colliery	Pittston borough	do.
8	No. 4 slope	Jenkins township	do.
9	No. 5 slope or Grand tunnel	Pittston township	do.
10	Tomkin's colliery	do. borough	Alva Tomkins.
11	Maryland National Anthracite colliery	do. township	Thomas Waddell—now Pennsylvania coal company.
12	No. 9 shaft colliery	do. borough	Pennsylvania coal company.
13	No. 10 shaft colliery	do. township	do.
14	No. 8 shaft colliery	do. do.	do.
15	No. 6 slope	do. do.	do.
16	Seneca colliery	do. borough	Pittston and Elmira coal company.
17	Ravine colliery	do. do.	do.
18	Beaver mines or Morgan slope	do. do.	Beaver & Co.
19	Rock Hill tunnel	do. do.	Bowkly & Son.
20	Twin shaft	do. do.	Pittston and Elmira coal company.
21	Rough and Ready colliery	do. township	National iron company of Danville.
22	Columbia tunnel	do. do.	Grove Brothers of Danville.
23	Butler colliery	do. do.	Butler coal company.
24	Ontario colliery	Pleasant Valley borough	Luzerne coal and iron company.
25	Enterprise colliery	do. do.	Hillside do. do.
26	Enterprise drift	do. do.	do. do. do.
27	Brown's colliery tunnel	do. do.	Pennsylvania coal company.
28	Dawson shaft	do. do.	do. do.

CONDITION OF MINES—*Continued.*

No. of colliery or mine	Name of colliery or mine.	Township, city or borough where located.	By whom operated.
29	Stark's colliery	Lackawanna township	Pennsylvania coal company.
30	Spring Brook colliery	do	Glenwood do.
31	Oak Hill colliery	do	do.
32	Carbon Hill colliery	Old Forge do	do.
33	Elliott Keorner's colliery	do	Elliot, Keorner & Co.
34	Pine colliery	Lackawanna do	Delaware, Lackawanna and Western railroad company.
35	Taylor colliery, shaft	do	do do.
36	Taylor colliery, drift	do	do do.
37	Coray breaker colliery	do	Lackawanna, Susquehanna coal and iron company.
38	Greenwood breaker colliery	do	do do.
39	Stafford Brook colliery	do	Susquehanna and West Virginia railroad company.
40	National Anthracite colliery	City of Scranton	do do.
41	Meadow Brook colliery	do	William Connell & Co.
42	Local Coal Sale mines	do	Gardner, Clark & Co.
43	Scranton coal company's mines	Lackawanna township	Delaware, Lackawanna and Western railroad company.
44	Dodge colliery	do	do do.
45	Bellevue shaft colliery	do	do do.
46	Bellevue slope colliery	do	do do.
47	Oxford shaft colliery	City of Scranton	do do.
48	Central shaft colliery	do	do do.
49	Sloan colliery	Lackawanna township	do do.
50	Archbald colliery	do	do do.
51	Continental colliery	do	do do.
52	Hampton colliery	do	do do.
53	Hyde Park colliery	City of Scranton	do do.
54	Capouse colliery	do	Lackawanna iron and coal company.
55	Mount Pleasant colliery	do	Mount Pleasant coal company.
56	Fellow's Local Coal mine	do	J. T. Fellows.
57	No. 2 Diamond shaft	do	Delaware, Lackawanna and Western railroad company.
58	No. 2 Diamond slope	do	do do.
59	Tripp's slope	do	do do.

60	Brisbin shaft	City of Scranton	Delaware, Lackawanna and Western railroad company.
61.....	Cayuga shaft	....do	....do
62.....	Von Storck colliery	....do	Delaware and Hudson canal company.
63.....	Leggitt's Creek colliery	....do	....do
64.....	Marvin shaft	....do	....do
65.....	Rolling Mill colliery	....do	Lackawanna iron and coal company.
66.....	Pine Brook colliery	....do	....do
67.....	Fairlawn slope	....do	Fairlawn coal company are sinking it.
68	Green Ridge colliery	Dunmore borough	Filer & Co.
69.....	No. 2 shaft, Dunmore	....do	Pennsylvania coal company.
70.....	Roaring Brook colliery	....do	Roaring Brook coal company.
71.....	Gipsy Grove colliery	....do	Pennsylvania coal company.
72	Elk Hill colliery	Blakely township	Elk Hill coal and iron company.
73	No. 2 or Dip mines	....do	Delaware and Hudson canal company.
74.....	Eddy Creek shaft	....do	....do
75.....	No. 1 colliery, Olyphant	....do	....do
76.....	No. 3 colliery, Olyphant	....do	....do
77.....	Grassy Island colliery	....do	....do
78.....	Eaton & Co.'s	....do	Eaton & Co.
79	White Oak colliery	....do	Delaware and Hudson canal company.
80.....	No. 1 shaft, Gibsonburg	Gibsonburg borough	John Jermyn.
81.....	Jermyn's slope	....do	John Jermyn.
82.....	Erie colliery	Carbondale township	Glenwood coal company.
83.....	Powderly slope	....do	Delaware and Hudson canal company.
84	Powderly Rock tunnel	....do	....do
85.....	No. 1 slope	Carbondale city	....do
86	White Bridge tunnel	....do	....do
87	No. 3 shaft, Carbondale	....do	....do
88	Coal Brook tunnel	....do	....do
89.....	Breaker tunnel	....do	....do
90.....	Lackawanna tunnel	....do	....do
91.....	Valley tunnel	....do	....do
92	Mill Ridge tunnel	Fell township	....do
93.....	Jefferson tunnel	....do	....do
94.....	No. 12 shaft	Pleasant Valley borough	Pennsylvania coal company.
95.....	No. 13 shaft	....do	.... do
	No. 2 breaker	Pittston borough	....do
	New breaker	Dunmore borough	....do
	Dunmore screens	....do	....do
	Rackett's Brook breaker	Carbondale township	Delaware and Hudson canal company.

Total—7 steam jets, 69 furnaces, 21 natural, 13 fans and 1 water-fall.

CONDITION OF MINES—*Continued.*

Number of colliery or mine.	Mode of ventilation.	Shafts.	Slopes.	Tunnels.	Number of breakers...	Number of screens and schutes.	No. of persons employed at each colliery or mine	Am't of coal mined at each colliery or mine,	Average thickness of each vein	Average thickness of each vein
1	Steam jet		1			1	74	26, 466	Pittston	10
2	Furnace			1			125			10
3	Steam jet				1		168	65, 248	Pittston	12
4	Natural	1					96	64, 069	Pittston	10½
5	Natural and steam jet	1					66	40, 868	Pittston	10
6	Suction fan	1				1	145	76, 512	Pittston	12
7	Natural	1					143	93, 050	Pittston	11
8	Natural		1			1	128	74, 607	Pittston	11
9	Natural		1	1		1	134	94, 024	Pittston	12
10	Furnace	1	1	2	1		99	16, 434	Third and Checkered	6, 4½
11	Furnace and steam jet	1	1	2	1		75	16, 000	Pittston Bottom	8½
12	Furnace	1					64	27, 584	Pittston	9
13	Furnace and natural	Double shaft			1		305	147, 408	Pittston and Checkered	8½, 6
14	Natural	1					195	90, 568	Pittston	10
15	Natural		1		1		66	31, 247	Checkered	6
16	Natural and furnace		1		1		167	55, 719	Checkered and Pittston	6½, 10
17	Natural and furnace	1			1		147	44, 521	Checkered and Pittston	6½, 10
18	Natural			1	1		36	25, 807	Checkered	6½
19	Natural			1	1		48	16, 000	Checkered	7½
20	Steam jet	2			1		138	49, 807	Checkered and Pittston	6, 8
21	Furnace	1			1		32	5, 000	Checkered and Butler	6, 8
22	Furnace			1	1		42	25, 841	Pittston	8
23	Natural and fan [cessary,	1		2	1		120	27, 524	Pittston and Butler	14, 8
24	Natu'l—assisted by grates when ne-		1	2	1		201	50, 000	Butler	10
25	Steam jet	1			2		183	64, 900	Stark	6½
26	Furnace			1			41		Brown	12
27	Natural—furnace when necessary			1	1		95	47, 688	Brown	8½
28	Natural	1					142	70, 558	Powdermill	7

29	Natural	1			1	
30	2 furnaces			2	1	
31	3 furnaces			3	1	
32	1 furnace and steam jet	2		1	1	
33	Sinking fan	1	1		1 building	
34	Sinking fan	1	1		1	
35	Fan	1			1	
36	Furnace			1		
37	2 furnaces			2	1	
38	Furnace			1	1	
39	Furnaces	1		2	1	
40	2 furnaces			4	1	
41	3 furnaces			4	1	
42	Furnace		1	2	1	
43	Furnace		1	1	1	
44	Double furnace	1			1	
45	Furnace	1			1	
46	Furnace		1		1	
47	Brick furnace	1			1	
48	Fan	1			1	
49	Driving for second opening	1	1		1	
50	Fan	1	1		1	
51	Fan	1			1	
52	Furnace	1			1	
53	Fan	1			1	
54	Fan	2, one just sinking			1	
55	Furnaces		1		1	
56	Natural			1	1	
57	Furnaces	Double shaft			1	
58	Furnace		1		1	
59	Furnace		1			
60	Sinking	1				
61	Fan	1			1	
62	Fan	1	1		1	
63	Fan	1			1	
64	Sinking	1			1 building	
65	Furnaces		1	1		
66	Furnace and fan	1			1	
67	Furnace and fan		1			
68	Furnace and fan		1		1	
69	Furnace and fan	1	1			1
70	Furnace and fan	1			2	
71	Furnaces	1		4	1	

179	82,916	Powdermill	8
151	10,216	Spring Brook	6
111	29,607	Spring Brook	6
132	36,539	Carbon Hill	6
48			
59			
281	159,989	Clark	9
33		F	7
198	52,893		6
164	40,964	Old	6½
143	72,580	No. 2	8
248	109,589	No. 2 and 3	8, 9
281	162,963	No. 2 and 3	8, 7½
32		Rolling Mill	4½
276	113,886	G or Big	13
305	158,940	G and F	12, 7
219	182,540	G or Big	12
177		Diamond and Rock	7 each.
255	129,952	Diamond and Rock	6, 8
257	82,277	G or Big	12
25			
169	25,521	G or Big and Rock	10, 6½
276	124,624	Clark	7
302	98,928	Diamond	5½
290	104,387	G or Big	12
270	134,417	E and F	6, 8
177	104,136	E and F	7
40	16,000	E	7
428		E and G	6, 12
250	375,794	G or Big	12
116		E	10
32			
228	93,615	G. or Big	9
416	166,481	E, G and Clark	5½, 8, 9
352	162,028	E and G	6, 8
59			
143	42,569	Rolling Mill	4½
140	28,505	Clark	6½
22			
284	126,906	Clark	8
110	52,098	Lowest Dunmore	4
327	168,957	No. 1, 2 and 3	5
227	98,891	Lower Dunmore	4½

CONDITION OF MINES — *Continued.*

No. of colliery or mine	Mode of ventilation.	Shafts	Slopes	Tunnels	No. of breakers	Number of screens and schutes	Number of persons employed at each colliery or mine.	Amount of coal mined at each colliery or mine.	Average thickness of each vein.	Average thickness of each vein.
72	Furnace			2	1		169	79,327	No. 2	7
73	Furnace			1	1		197	113,180	No. 1	7
74	Water-fall	1		1			45	104,049	No. 2	5
75	Furnace		1	1	1		242		No. 1 and 2	7
76	Furnace		1	1	1		31	23,285	No. 2	5
77	Furnace	1			1		334	152,499	G or Big	10
78	Natural			4	1		344	144,918	Lackawanna	10
79	Furnace		1	2	1		326	136,690	Bottom	10
80	Furnace	1		1	2		311	117,741	Carbondale	11
81	Furnace		1				369	144,343	Corbondale	11
82	Furnace	1			1		149	10,266	Carbondale	10
83	Fan		1			1	168		Top and Bottom	5
84	Small furnace			1			76		Bottom	5
85	Natural		1			1	6	335,593	Bottom	5
86	Furnace			1			194		Top and Bottom	6
87	Natural—assisted by furnace	1	1			1	165		Bottom	5
88	Furnace			1			295		Bottom	5
89	Furnace			1			76		Bottom	5
90	Furnace			1			82		Bottom	5
91	Furnace			1			62	167,858	Bottom	6
92	Small furnace			1			36		Top	5
93	Small furnace			1			26		Bottom	5
94	Sinking	1			1 building		20			
95	Sinking	1					20			
					1		52			
					1		15			
						1	73			
					1		54			
		52	30	65	71	10	15,261	6,590,450		

ABANDONED MINES.

Name of colliery or mine.	Where located.	By whom operated.
Eagle shaft	Jenkins township	Alva Tomkins.
No. 3 slope	Jenkins township	Pennsylvania Coal Co.
* No. 1 mines	Pittston borough	Pennsylvania Coal Co.
* No. 2 shaft	Pittston borough	Pennsylvania Coal Co.
* No. 3 shaft	Pittston borough	Pennsylvania Coal Co.
No. 1 shaft	Dunmore borough	Pennsylvania Coal Co.
Rockwell's mines	Providence, now Scrant	
Clark's mines	Providence, now Scrant	
Part of Elk Hill Coal Co.'s mines	Blakely township	Elk Hill Coal company
Top vein of No. 3 colliery	Blakely township	Del. and Hudson C. Co.
Top vein of Grassy Island colliery,	Blakely township	Del. and Hudson C. Co.
Nos. 4 and 5 tunnels	Blakely township	Eaton & Co.
Nos. 1 and 2 tunnels, White Oak	Blakely township	Del. and Hudson C. Co.
No. 2 mines, Carbondale	Carbondale city	Del. and Hudson C. Co.

* Now used for pumping.

LOCAL COAL SALE MINES.

Name of colliery or mine.	Where located.	By whom operated.	Shafts.	Slopes.	Tunnels.	Breakers.	No. screens and schutes.	Amount of coal mined at each col'y or mine.	Name of veins worked.	Av. thickn's of each vein.
Two local coal sale mines	Pittston township	M. N. A. Coal Co.		1	1				Pittston	10
Local coal sale mines	Scranton city	Jno. Gibson & Co			1		1		Rolling Mill	4½
Hoy's coal sale mines	Scranton city	Hoy & Co.			1		1		Rolling Mill	4½
Joseph Church's local coal sale mine	Second ward, Scranton city				2		1		Church	5½
Michael Rock's local coal sale mine	Third ward, Scranton city			1				825	Clark	7
Griffin & Leach's local coal sale mine	Third ward, Scranton city				1				Clark	7
Hancock & Dean's local coal sale mine	First ward, Scranton city				1		1		Lower	5
Pulaski Carter's local coal sale mine	Second ward, Scranton city				1			1,731	Dunmore	5
James Young's local coal sale mine	Dunmore borough				1			500	Dunmore	4
Anthony Maloney's local coal sale mine	Dunmore borough				1			480	Dunmore	4
Martin Cuppen's local coal sale mine	Blakely township				2			2,500	No. 2	5½
Lyon's local coal sale mine	Blakely township				1		1			
Henry Bowen's local coal sale mine	Blakely township				1		1		No. 2	5½
Thos. M'Loughlin's local coal sale mine	Gibsonburg borough				1		1			
Dockerty's local coal sale mine	Fourth ward, Carbondale		1				1		Top and bottom	7, 5
Hendricks & Thomas' local coal sale mine	First ward, Carbondale city				1	1			Bottom	5
Thos. Brennan's local coal sale mine	First ward, Carbondale city				1	1			Bottom	5
S. S. Clark's local coal sale mine	First ward, Carbondale city				1	1			Bottom	5
M'Garry & Brennan's local coal sale mine	Frogtown, Fell township				1					
C. H. Whitman's local coal sale mine	Fell township				1			200		
J. C. & J. W. Williams' local coal sale m.	Fell township				1		1			

REPORT OF THE CONDITION *of Steam Boilers and Steam Engines in the Eastern District of the Wyoming Coal Fields for the year ending December* 31, 1872.

No. of colliery	Name of colliery.	No. of boilers.	Dimensions. Length in feet	Dimensions. Diameter in inches	Pressure	Steam gauge or safety valve.	Date of boiler examination.	Present condition	No. of hoisting engines	How many ho. power	No. of pumping engines	How many ho. power	No. of engines in mines	How many ho. power	Breaker engine	Horse power	Fan engine	Hors e power
1	No. 2 or Port Griffith	3	46	30	80	Both	Nov. 11	Good.	1	40			4	120				
	No. 2 or Port Griffith	3	46	30	80	"	Nov. 12	"										
2	Everhart colliery	Not	working	in	1872.	"			1	40	Also	used f	or ru	nning	breaker ma	chine	ry.	
3	No. 6 shaft colliery	3	36	30	70	"	Oct. 30	"	1	40					1	30		
	No. 6 shaft breaker	3	36	30	70	"	Oct. 30	"										
4	No. 5 shaft	3	36	30	70	"	Oct. 30	"	1	40								
5	No. 11 shaft	3	36	30	70	"	Oct. 30	"	1	40								
6	No. 7 shaft	5	36	30	70	"	Nov. 4	"	2	160								
7	No. 4 shaft	4	36	30	70	"	Oct. 26	"	2	80			2	20			2	20
		3	36	30	70	"	New											
8	No. 4 slope	2	36	30	70	"	Oct. 25	"	1	120								
9	No. 5 slope or Grand tunnel,	3	36	30	70	"	Oct. 29	"	1	120								
10	Tomkins colliery	6	30	30	75	"	Aug. 29	"	1	40	1	30			1	15		
11	Maryland Nat. Anth. coll'y,	3	32	30	75	"	Suspend. in	May l	ast. 1	80	Also	used f	or pu	mp'g	in the	shaft.		
	Maryland Nat. Ant. breaker	1	32	30	60	"												
12	No. 9 shaft colliery	3	36	30	70	"	Oct. 23	Good.	1	140								
13	No. 10 shaft colliery	3	36	30	80	"	Nov. 18	"	1	30	for slo	pe.						
	No. 10 shaft colliery	3	36	30	80	"	Nov. 18	"	1	40	1	40	1	30	1	40		
14	No. 8 shaft colliery	5	36	34	60	"	Nov. 8	"	2	40	1	25	1	25				
15	No. 6 slope	3	36	30	60	"	Nov. 9	"	2	40			1	30				
16	Seneca colliery	2	36	30	60to75	"	June.	"	1	40					1	30		
	Seneca colliery	2	36	26	60to75	"	June.	"										
17	Ravine colliery	4	36	30	60to75	"	June.	"	1	60					1	20		
18	Beaver mines or Morgan slo.	2	32	30	75	"	Jan. 1	"	1	20								
19	Rock Hill tunnel	2	20	30	60	"		"							1	25		
20	Twin shafts	2	36	30	60to75	"	June.	"	1	60	1	40			1	10		
	Twin shafts	2	36	26	60to75	"	June.	"										
21	Rough and Ready colliery	3	36	32	60	"	Suspend. in	May l	ast. 1	40	Also	used f	or pu	mp'g.				
22	Columbia tunnel	1	32	30	60	"	Sept. 2	Good.							1	25		
23	Butler colliery	4	29	32	65	"	Nov. 14	"	2	80			1					
		3	28	32	65													

Report of Condition of Steam Boilers and Engines—*Continued.*

No. of colliery	Name of colliery.	No. of boilers.	Dimensions. Length in feet	Dimensions. Diameter in inches	Pressure	Steam gauge or safety valve.	Date of boiler examination.	Present condition	No. of hoisting engines	How many ho. power	No. of pumping engines	How many ho. power	No. of engines in mines	How many ho. power	Breaker engine	Horse power	Fan engine	Horse power
	No. 2 shaft, Pittston	3	36	30	70	Both	Nov. 20...	Good.			1	30						
	No. 3 shaft, Pittston	3	36	30	70	"	Nov. 23...	"			1	30						
	No. 2 breaker, Pittston					"	Have worked only two months since boilers were exa'd.								1	40		
24...	Ontario colliery	6	30	30		"		Good.	2	70					1	25		
25...	Enterprise colliery	3	30	30	80	"	Dec.	"	2	160					1	35		
	Enterprise colliery	3	30	30	80	"	Dec.	"										
	Enterprise colliery	2	30	30	80	"	Dec.	"										
26...	Dawson shaft, Brown's col'y	3	36	30	90	"	Oct. 17...	"	2	80					1	25		
27...	Stark's colliery	5	36	30	80	"	Nov. 28...	"	2 1	40 40	for slope.				1	25		
28...	Spring Brook colliery	3	30	30	50	"		"	2	80					1	35		
	Spring Brook colliery	3	30	30	50	"		"										
29...	Oak Hill colliery	2	30	30	45	"	June 16...	"							1	35		
	Carbon Hill col'y, No. 2 shaft	6	28	26	70	"	June 9...	"	2	80	1	40						
	Carbon Hill breaker	2	36	33	50	"	April.	"							1	20		
	Carbon Hill, No. 1 shaft	4	36	28	70	"	June 10...	"										
30...	Elliot Kœrner's colliery	4	30	30		"	New	"	2	80					1	40	1	15
	Elliot Kœrner's colliery	4	30	30		"	New	"										
31...	Pyne colliery, shaft No. 1	3	30	34	85													
	Pyne colliery, shaft No. 2	3	30	34			Nov. 16...	"	1	95								
	Pyne colliery, shaft No. 3	3	30	34		"	Nov. 19...	"					1	15				
	Pyne colliery, shaft No. 4	3	30	34			Nov. 19...	"	1	20							1	10
	Pyne colliery slope	1	10	40	90													
32...	Taylor colliery	3	30	34	75	"	Jan. 7, 1873	"	2	170	1	130					1	95
	Taylor colliery	3	30	34	75	"	Jan. 8, 1873	"							1	73		
	Taylor colliery	3	30	34	75	"	Nov. 11...	"					3	132				
	Taylor colliery	3	30	34	75	"	Nov. 16...	"										
33...	Coray breaker	3	30	30	65	"		"							1	60		
34...	Greenwood breaker	2	30	30	65	"		"							1	25		
35...	Stafford Brook colliery	2	30	30	75	"	Oct. 6...	"	1	40								
	Stafford Brook colliery	2	30	34	75	"	Oct. 6...	"							1	25		
36...	National Anthracite colliery	4	30	34	75	"	Oct. 6...	"	2	60					1	25		

37...	Meadow Brook colliery	3	30	34	75	Both.	Oct. 6	Good.							1	45		
38...	Local coal sale mine	1	locomotive.			"		"							1	15		
39...	Scranton Coal Co.'s mine	4	32	34	75	"	Sept. 8	"	1	95			3	103				
	Scranton Coal Co.'s breaker,	4	30	34	75	"	Sept. 8	"							1	95		
40...	Dodge colliery	3	36	34	75	"	Nov. 29	"	2	130	1	130						
	Dodge colliery	3	36	34	75	"	Dec. 4	"										
	Dodge colliery breaker	3	30	34	75	"	Nov. 20	"							1	73		
41...	Bellevue shaft	5	36	34	75	"	Nov. 20	"	2	170	1	95		30	1	58		
42...	Bellevue slope	4	34	34	75	"	Nov. 16	"	2	170	1	95	1	20	1	58		
43...	Oxford shaft	3	40	34	75	"	Oct. 14	"	2	100			1	25				
	Oxford shaft	3	40	34	75	"	Oct. 19	"			1	95						
	Oxford shaft	3	40	34	75	"	Oct. 22	"							1	60		
44...	Central shaft	3	30	34	75	"	Jan. 1, '73	"	2	170	2	320	1	15	1	95	1	73
	Central shaft	3	30	34	75	"	Jan. 1, '73	"										
	Central shaft	3	30	34	75	"	Nov. 28	"										
	Central shaft	3	30	34	75	"	Nov. 29	"										
45...	Sloan colliery	3	30	34	75	"	Dec. 26	"	3	200			4	78	1	95	1	73
		3	30	34		"												
	Sloan colliery	3	30	34	75	"	Dec. 26	"										
		3	30	34		"												
46...	Archbald colliery	3	30	34	75	"	Oct. 15	"	2	170			1	20	1	95	1	73
	Archbald colliery	3	30	34	75	"	Oct. 17	"										
	Archbald slope	1	locomotive		boiler	"	Oct. 17	"	1	20								
	Archbald slope	4	30	34	not in use yet.			"										
47...	Continental colliery	3	40½	34	75	Both.	Dec. 16	"	2	150	1	95	1	80	1	58	1	20
	Continental colliery	3	40½	34	75	"	Jan. 8, '73	"										
	Continental colliery	3	40½	34	75	"	Jan. 25, '73	"										
48...	Hampton colliery	3	36½	34	75	"	Jan. 1, '73	"	2	130		160	4	180	1	95		
	Hampton colliery	4	36½	34	75	"	Jan. 18, '73	"	2	24	inside							
	Hampton colliery	3	36½	34	75	"	Jan. 8, '73	"										
	Hampton colliery	3	36½	34	75	"	Jan. 21, '73	"										
49...	Hyde Park colliery	2	38	34	75	"	Jan. 8, '73	"	2	170	1 fi. p.	20	1	80	1	95		
	Hyde Park colliery	2	38	34	75	"	Jan. 9, '73	"										
50...	Capouse colliery	3	30	36	80	"	Dec. 12	"	2	80	1	70	1	5	1	40	1	15
	Capouse colliery	3	30	36	80	"	Dec. 12	"										
	Capouse colliery	3	30	36	80	"	Dec. 12	"										
51...	Mt. Pleasant colliery	4	35	30	80	"	June 6	"	1	70			1	10	1	25		
	Mt. Pleasant colliery	1	20	30	80	"	June 6	"										
	Mt. Pleasant colliery	1	16	42	80	"	June 6	"										
52...	Fellows' local coal mine	2	30	30	70	"	New	"			1	20			1	20		
53...	No. 2 Diamond shaft	3	40	34	80	"	Sept. 16	"	4	260	1	130	3	150				
	No. 2 Diamond shaft	3	40	34	80	"	Sept. 28	"										
	No. 2 Diamond shaft	4	40	34	80	"	Oct. 14	"										

REPORT OF CONDITION OF STEAM BOILERS AND ENGINES—*Continued.*

No. of colliery.	Name of colliery.	No. of boilers.	Dimensions.		Pressure	Steam gauge or safety valve	Date of boiler examination.	Present condition	No. of hoisting engines	How many ho. power	No. of pumpi'g engines	How many ho. power	No. of engines in mines	How many ho. power	Breaker engi'e	Horse power	Fan engine	Horse power
			Length in feet.	Diameter in inc'es.														
	No. 2 Diamond breaker	4	26	30	75	Both.	Jan. 14, '73	Good.							1	65		
54...	No. 2 Diamond slope	4	36	34	75	"	Jan. 23, '73	"	1	95			2	150	1	30		
	No. 2 Diamond slope	3	34	34	75	"	Jan. 28, '73	"										
	New Diamond air shaft	3	30	34	75	"	New.	"										
	New Diamond air shaft	3	30	34	75	"	New.	"										
55...	Tripp's slope,	4	30	30	85	"	July 3	"	2	70			3	60				
56...	Brisbin shaft	3	30	34	80	"	New.	"	2	170			2	14			1	8
	Brisbin shaft	3	30	34	80	"	New.	"										
57...	Cayuga shaft	3	30	34	75	"	Nov. 1	"	2	170	2	320	1	25	1	73	1	73
	Cayuga shaft	3	30	34	75	"	Nov. 27	"										
	Cayuga shaft	3	30	34	75	"	Dec. 11	"										
	Cayuga shaft	3	30	34	75	"	Dec. 17	"										
58...	Von Storch colliery slope	3	36	34	75	"	Jan. 12, '73	"	2	123	1	105	1	25	1	61		
	Von Storch colliery slope	3	36	34	75	"	Jan. 12, '73	"										
	Von Storch colliery slope	3	36	34	75	"	Jan. 12, '73	"										
	Von Storch colliery slope	3	36	34	75	"	Jan. 12, '73	"										
	Von Storch colliery shaft	4	36	34	75	"	Jan. 12, '73	"	2	72								
	Von Storch colliery shaft	4	36	34	75	"	Jan. 12, '73	"									1	49
59...	Leggitt's Creek shaft	3	30	34	80	"	Jan. 3, '73	"	3	184	1	105			1	77	1	49
	Leggitt's Creek shaft	3	30	34	80	"	Jan. 3, '73	"	1	77								
	Leggitt's Creek shaft	3	30	34	80	"	Jan. 3, '73	"										
	Leggitt's Creek shaft	2	30	34	80	"	Jan. 3, '73	"										
60...	Marvin shaft	3	36	34	60	"	Jan. 5, '73	"	4	150								
	Marvin shaft	3	36	34	60	"	Jan. 5, '73	"										
61...	Rolling Mill colliery	4	40	34	80	"	Dec. 12	"	2	80			1	40				
	Rolling Mill colliery	3	30	36	80	"	Dec. 12	"										
62...	Pine Brook colliery	6	30	36	80	"	Dec. 12	"	2	60	1	75	1	15	1	30	1	10
	Pine Brook colliery	3	24	36	80	"	Dec. 12	"										
63...	Fairlawn slope	2	36	34	65	"	New.	"	1	20	also used for pumping.							
64...	Green Ridge colliery	3	40	36	65	"	June 2	"	2	80					1	25		
65	No. 2 shaft, Dunmore	3	36	30	60	"	Jan. 5, '73	"	1	40	with pumping gear attached							
66..	Roaring Brook colliery	3	25	30	75	"	Feb. 8, '73	"	2	70	1	60						

	Roaring Brook colliery	4	36	36	75	Both.	Feb. 8	Good.									1	35		
	Roaring Brook colliery	1	12	40	75	"	Feb. 8	"	2	40							1	10		
	Roaring Brook colliery	1	14½	40	75	"	Feb. 8	"	1	25										
67	Gipsy Grove colliery	4	36	30	60	"	Jan. 5, '73	"	2	60	1	100								
68	Elk Hill colliery	2	50	34	75	"	Mar. 25	"									1	40		
69	No. 2 or Dip mines	3	36	34	50	"	Jan. 13, '73	"	1	36							1	36		
70	Eddy Creek shaft	3	36	34	80	"	Jan. 13, '73	"	2	118	1	77	1	65						
	Eddy Creek shaft	3	36	34	80	"	Jan. 13, '73	"												
71	No. 1 colliery, Olyyhant	4	36	34	60	"	Jan. 19, '73	"	1	43							1	36		
72	No. 3 colliery, Olyphant	4	36	34	60	"	Not work'g	"	1	43							1	36		
73	Grassy Island colliery	3	36	34	80	"	Jan. 19, '73	"	2	72	1	77	1	98						
	Grassy Island colliery	3	36	34	80	"	Jan. 19, '73	"												
	Grassy Island colliery	3	36	34	80	"	Jan. 19, '73	"												
	Grassy Island breaker	3	36	34	70	"	Jan. 19, '73	"									1	77		
74	Eaton & Co.'s mines breaker	3	40	34	60	"	Sept. 1	"	2								1			
75	White Oak colliery	3	36	34	70	"	Jan. 7, '73	"	1	54	2	38					1	62		
	White Oak colliery	3	36	34	70	"	Jan. 7, '73	"												
76	No. 1 shaft, Gibsonburg	3	36	34	70	"	Aug. 26	"	2	50										
	No. 1 shaft, Gibsonburg	3	36	34	70	"	Aug. 26	"												
77	Jermyn's slope	4	30	34	70	"	Aug. 26	"			1	60					1	25		
	No. 1 shaft breaker	2	36	34	70	"	Aug. 26	"									1	25		
78	Erie colliery	3	36	34	70	"	Mar. 25	"												
	Erie colliery	3	36	34	70	"	Mar. 25	"	2	70	1	60					1	25		
	Erie colliery	3	36	34	70	"	Mar. 25	"												
79	Powderly slope	3	36	34	70	"	Jan. 11, '73	"	2	118	2	96	2	35						
	Powderly slope	3	36	34	70	"	Jan. 11, '73	"												
80	No. 1 pumping shaft	2	36	34	70	"	Jan. 21, '73	"			1	62								
81	No. 3 shaft, Carbondale	3	36	34	70	"	Dec. 21	"	1	77	used	for pu	mpi'g	also.						
	No. 3 shaft, Carbondale	3	36	34	70	"	Dec. 21	"												
82	Coal Brook tunnel breaker	4	30	34	70	"	Dec. 11	"	1	56							1	77		
83	Rackett's Brook breaker	5	50	34	60	"	Dec. 17										1	77		
84	New breaker, Dunmore	3	36	30	60	"	No report										1	25		
85	Screens at Dunmore	3	36	30	60	"	New										1	50		
		512	17,195						133	6,837	35	2,830	53	1,745			61	2,697	15	583

NOTE.—Ontario colliery has three nests with two boilers in each. The pumping engines of Enterprise colliery are also used for running one breaker. Spring Brook colliery is a new one, and has not been worked since May last. Oak Hill colliery has also been idle since last June. Two locomotive engines, of 20-horse power each, are in use at the Meadow Brook colliery. Bellevue shaft has one fire pump of 30 horse power. A 6-horse pump is used inside at No. 2 Diamond shaft. Tripp's slope has not been worked during the past four months. Erie colliery has been idle since May, and its hoisting engines are only used for pumping.

No. 2 or Port Griffith Slope.

May 1st, I inspected the above named colliery, opened by the Pennsylvania coal company. John B. Smith is general superintendent, William Law is general mine superintendent, and Henry Jopling is mine boss.

This slope is 1,029 feet long, driven at an angle of 30°. There is no breaker attached to this mine. They send the coal to be prepared to No. 2 breaker, Pittston, and to the new breaker in Dunmore. They mine 150 tons of coal per day. They employ 24 miners, 23 laborers, 6 drivers, 1 door-boy and 7 company men in the mine. They employ outside 8 company men, 4 mechanics and 1 boss. They employ in all 74 men. They are working the Pittston or 14 feet vein. The average thickness of this vein is 10 feet. They drive headings 10 feet, airways 15 feet and chambers 24 feet wide; leave cross entrances for the purpose of ventilation from 18 to 30 feet apart, and leave pillars to sustain the roof from 16 to 18 feet thick. The roof is coal and rock. They have furnished a map of the mine. They are connected with No. 6 shaft, which can be used as a second opening. It is about 2,500 feet east from the mouth of the slope. There is no house for the men to wash or change their clothes in; the men have not asked for it yet. They have an adequate amount of ventilation; it is conducted to the face of the workings in two splits—the intake is from No. 6 shaft workings, and the outcast at mouth of slope. The ventilation is assisted by the use of steam exhausts in the slope. There are large quantities of noxious and poisonous gases evolved in this mine. There is no standing water or gas in mine. The currents of air are so conducted as to carry all the gas away. The ventilation is good. They have an average of 33,000 cubic feet of fresh air per minute.

The mining boss seems to be a competent, practical and careful man. He has no assistant and attends to all the duties appertaining to the office himself. The mine is examined morning and evening. The air-doors or gates are hung so that they will close of their own accord. The ventilation is measured and reported according to law. They have double doors hung on traveled roads, so as to keep up a steady current of air. They have a metal speaking tube in the slope; they have a safety arrangement for men coming up; they walk down; they have an adequate brake on the hoisting drum. The strength of main links and ropes is tested daily by hoisting coal in the slope. There are no boys working in the mine under twelve years of age. The engineers are competent, practical and sober men. There are no persons allowed to ride on loaded cars in the slope. They do not allow more than ten men to ride on a car in the slope at one time. The parties having charge know their duty in case of death or serious accident. The boilers have been cleaned and examined once every six months and reported in good condition. The feed pipes and water gauge cocks are in good condition. They have a steam gauge to indicate the pressure of steam per square inch. They use one hoisting engine of 40-horse power and four steam pumps; aggregate 120 horse power. The area of the intake air-way, which is No. 6 shaft, is 120 feet and the area of the outcast, which is at the mouth of the slope, is 80 feet.

Remarks.—This slope is located on the east bank of the Susquehanna river, two and one-half miles south-west of Pittston, in Jenkins township. This slope has been in operation for twenty-two years. They do not work more than 50 men in any one split of air.

Everhart Colliery.

This colliery is located in Jenkins township, and situated about three miles south-east of the Susquehanna river and close to the outcrop of the coal measures. It is operated by Everhart & Co. The opening is a tunnel driven in coal. There is a breaker located about 700 feet from the mouth of the tunnel. They have not mined or shipped any coal from this colliery for the year 1872. When last working they mined and shipped about 300 tons of coal per day. They employed when last working, 84 men and boys in the mine and 41 men and boys outside—in all 125 men and boys. The character of the workings is a water-level tunnel with pillars and chamber. The average thickness of the coal is 10 feet. They worked headings 12, airways 10 and chambers 24 feet wide. They leave pillars from 12 to 15 feet wide to sustain the roof, and cross-entrances from 30 to 36 feet apart for

the purpose of ventilation. The roof is hard rock. The mine was in good working condition.

Ventilation was produced by a furnace located 300 feet from the main opening. The intake is located at the mouth of the drift: area 108 feet. The outcast is located in the furnace air-shaft; area 36 feet. The main doors were hung so that they would close of their own accord. They had attendants at the main doors. The air was circulated to face of the workings in two splits. They had no instrument for measuring the amount of air. Ventilation was good.

Machinery.—They use one engine of 40-horse power to run the breaker machinery, and to hoist on the planes outside. There is no machinery required at the tunnel.

Remarks.—They have furnished a map of mine. They have a second opening. They had no house for men to wash or change in. They did not allow any person to work in the mine under twelve years of age. The parties having charge know their duty in case of death or serious accident. There is a branch railroad built from the Lehigh and Susquehanna division of the Central railroad of New Jersey to the colliery. The breaker machinery is fenced and boxed off so that operatives are safe.

No. 6 Shaft Colliery

Is located in Jenkins township, about two miles south-west of Pittston, on the east side of the Susquehanna river. It is 180 feet deep to the Checkered or 7 feet vein and 312 to the Pittston or 11 feet vein. This mine is operated by the Pennsylvania coal company, and John B. Smith is their general superintendent: Wm. Law is general mining superintendent; Thomas Aubrey is mining boss and Loftus Campbell is outside foreman.

Description.—They have a breaker attached to the shaft tower by a trestle 160 feet long. They mine about 250 tons of coal per day. All the coal mined at No. 6, 5 and 11 shafts is cleaned and prepared at No. 6 breaker. They employ 36 miners, 36 laborers, 15 drivers, 2 door-boys and 16 company men in the mine, and 30 slate pickers, 4 head and plate men, 2 drivers, 17 company men; 3 mechanics and 1 boss outside, in all 168 men and boys. They have two gravity planes in operation in the mine; one is 300 feet and the other 180 feet long. The loaded cars going down the planes, haul the light cars to the top. This is a very cheap mode of getting coal to the foot of the shaft. They are only working the Pittston vein; average thickness, twelve feet. They drive headings 10 feet, airways 15 feet and chambers 24 feet wide. Headings and airways are driven on a level and chambers on a pitch. The roof is good slate. They leave pillars to sustain the roof, from 16 to 18 feet wide. They leave cross entrances for the purpose of ventilation, from 18 to 30 feet apart.

Ventilation.—This mine is ventilated by steam at the outcast in No. 2 slope. The intake is located at Nos. 6 and 7 shafts. The air is conducted to the face of the workings in two splits or currents. They have air-doors and gates on the main traveled roads, so as to control the air-currents and force the air to the face or all the working places. They have double doors on the main traveled road with attendants so as to keep them closed. The main doors on headings and airways are hung so that they will close of their own accord. They work in one split 30 men and in the other 42 men. The amount of ventilation has been measured and reported monthly according to law. The amount of air at the intakes averages 28,750 cubic feet and at the outcast 30,000 cubic feet. Ventilation is good. The size of the intake air-way is 150 and 91 feet and upcast 80 feet.

Machinery.—They have two hoisting carriages in the shaft; one is a safety carriage with all the modern improvements. The ropes, links, chains and connections are in good condition. They have a metal speaking tube in the shaft, and have flanges of sufficient dimensions attached to the side of the hoisting drums. They have adequate brakes on hoising drums. The boilers have been cleaned, examined and reported in good condition. They use safety valves and steam gauges for safety and to indicate the pressure of steam. They use two hoisting engines of 70-horse power.

Remarks.—They have furnished a map of the mine. They have no house for men to wash and change their clothes in. They have no noxious, inflammable or poisonous gasses evolve in the mine. The mining boss seems to be a practical and

competent man. There are no persons allowed to ride on loaded wagons or carriages either on the planes or in the shaft. The mine is in a good, safe, working condition. The parties having charge know their duty in case of death or serious accident. The shaft landings are protected by safety-gates. The breaker machinery is boxed and fenced off, so that the operatives are safe.

No. 5 Shaft

Is located in Jenkins township, about two miles south-west of Pittston, on the east side of the Susquehanna river. It is 88 feet deep to the Checkered vein and 170 feet to the Pittston or 14 feet vein. This mine is operated by the Pennsylvania coal company. Benjamin Harding is mine boss.

Description.—They have no breaker attached to this mine, as the coal from this mine is prepared at No. 6 shaft breaker. They employ 34 miners, 34 laborers, 8 drivers, 2 door-boys, 7 company men in the mine; 2 drivers, 6 company men, 2 mechanics and one boss outside; in all 96 men and boys. They are working the Pittston or 14 feet vein; average thickness 10½ feet. The Checkered vein is not working. They have two gravity planes in the mine; length of each 350 feet. They drive headings 10 feet, air-ways 15 feet and chambers 24 feet wide. The nature of the roof is slate. They leave pillars to sustain it from 16 to 18 feet wide, and cross-entrances for the purpose of ventilation from 18 to 25 feet apart.

Ventilation.—Ventilation is produced in the mine by the action of the atmosphere. They have air-doors and gates on the main traveled roads, so as to control air-currents and force air to the face of all the working places. They have double doors on all main traveled roads with attendants so as to keep them closed. The main doors are hung so as to close of their own accord. The air is conducted to the face of workings in two splits or currents. They work 32 men in one and 36 men in the other. The amount of ventilation has been measured and reported monthly, according to law. The amount of air per measurement, at intake averages 16,500 feet per minute. The intake is located at No. 5 shaft and Nos. 3 and 4 slopes. The outcast is located at the mouth of No. 11 shaft. The area of intakes is 130 feet and outcast air-way 150 feet.

Machinery.—They use two hoisting carriages in the shaft; one is a safety-carriage with all the modern improvements. The ropes, links, chains and connections are in good order. They have a metal speaking tube in the mines. They have flanges of sufficient dimensions attached to the side of the hoisting drums. They have adequate breaks on the hoisting drums. They have bridle chains attached to the safety-carriage, where they hoist persons into and out of the mine. The boilers have been cleaned and examined, and all the feed pipes, water-guage cocks, &c., are in good condition. They use a steam guage to indicate the pressure of steam per square inch. They also use one hoisting engine of 40-horse power.

Remarks.—They have furnished a map of the mine. They have second openings nearest to shaft, 1,100 feet. They have no house for men to wash or change their clothes. They have no noxious or poisonous gases evolve in the mine. The mining boss seems to be a practical and competent man. There are no persons allowed to ride on loaded wagons or carriages in the mine. The engineers seem to be sober, competent and experienced men. The parties having charge know their duty in case of death or serious accident. The mine is in good, safe, working condition; there are no boys working in the mine under twelve years of age; the shaft landings are protected by safety-gates. In the ventilating of this mine the air currents are quite the reverse in summer to what they are in winter. This shaft is located three-fourths of a mile south-east from the Susquehanna river.

No. 11 Shaft.

This shaft is located in Jenkins township, two miles south-west of Pittston, on the east side of the Susquehanna river. It is 62 feet to the Checkered vein and 194 feet to the Pittston or 14 feet vein. This mine is operated by the Pennsylvacia coal company. Andrew Bryden is general mine superintendent and Benjamin Harding is mining boss.

Description.—The coal mined here is cleaned and prepared at No. 6 breaker, which is located 1,800 feet north-west. They employ 24 miners, 25 laborers, 5 drivers, 2 door-boys, 4 company men, in mine; 2 head and plate men, 1 driver, 1 company man, 2 mechanics, outside; in all, 66 men and boys. They are working the Pittston or 14 feet vein; average thickness, 10 feet; they drive headings 10, air-ways 15, and chambers from 20 to 24 feet wide. The roof is good slate; they have pillars to sustain it from 14 to 18 feet wide. They leave cross entrances for the purpose of ventilation, from 18 to 50 feet apart.

Ventilation.—The ventilation is produced by steam and the action of the atmosphere. They have air-doors and gates on the main traveled road, so as to control the air currents and force the air to all the working places. They have double doors on main traveled roads, with attendants, so as to keep them closed. The main doors are hung so that they will close of their own accord, The air is conducted to the face of the workings in one volume. They work 60 men in this volume. The amount of ventilation has been measured and reported according to law. The amount of ventilation averages 16,500 feet per minute. The in-take is located at shaft No. 5 and slopes Nos. 3 and 4; area about 100 feet. The out-cast is in main shaft; area about 100 feet.

Machinery.—They use 2 hoisting carriages in the shaft; one is a safety carriage with all the modern improvements. They use flanges of sufficient dimensions attached to the sides of the hoisting drum; they have an adequate break on hoisting drum. The strength of ropes, links, chains and connections are tested every day by hoisting coal. They have bridle chains attached to the safety carriage. They do not allow more than 10 men to ride on any wagon or cage at one time. The boilers, feed-pipes, water-gauge cocks, &c., have been cleaned and examined, and reported in good condition, according to law. They have a steam gauge to indicate the pessure of steam per square inch. They use 1 steam engine of 40-horse power.

Remarks.—They have furnished a map of mine; they have a second opening; they have no house for men to wash or change their clothes in: they have no noxious or posinous gasses involved in this mine; the mining boss and engineer seem to be practical, competant and sober men; the parties having charge know their duty in case of death or serious accident; the mine is in a good, safe, working condition; the shaft-landings are protected by safety gates: the shaft is located 1,500 feet south at No. 5 shaft.

Note.—The mines operated by the Pennsylvania coal company are worked regularly and systematically.

No. 7 Shaft.

This shaft is located in Jenkins township, about 1½ miles south-west of Pittston, and about ½ mile south-east of the Susquehanna river. It is 160 feet to the Checkered vein and 312 feet to the Pittston or 14 feet vein. This mine is operated by the Pennsylvania coal company. Wm. Law is general mine superintendent, Wm. Reed is mining boss.

Description.—There is no breaker attached to this mine, but they have large schutes attached to shaft tower; they mine and clean 350 tons of coal per day; they employ 40 miners, 44 laborers, 14 drivers, 6 door-boys, 17 company men, in mine; 4 slate pickers, 16 company men, 3 mechanics and 1 boss, outside; in all, 145 men and boys; they are working the Pittston or 14 feet vein; average thickness, 12 feet; they drive headings 10 feet, air-ways 15 feet, and chambers 24 feet wide. The nature of the roof is coal and rock; they leave pillars to sustain it, from 15 to 25 feet wide; they have cross entrances, for the purpose of ventilation, from 18 to 30 feet apart; they have 2 gravity planes in the mine operated, on the same principle as they are in No. 6 shaft; one is 350 and the other 196 feet long.

Ventilation.—Ventilation is produced by means of a suction fan; at No. 4 shaft they have air-doors and gates in the main traveled roads, so as to control the air currents and force the air to the face of all the working places: they have no double doors or traveled roads; they have attendants at all main doors, so as to keep them closed; the air is conducted to the face of the workings in 2 splits; they work 8 men in one split and 76 men in the other; the amount of ventilation has been measured and reported monthly, according to law; the intake is located at No. 7 shaft; amount of air per measurement is 25,200 feet per

minute; the out-cast is located at No. 4 shaft; the area of the in-take is 100 cubic feet and the area of the out-cast is 81 cubic feet; ventilation is good.

Machinery.—They have 2 hoisting carriages in the shaft; one is a safety carriage with all the modern improvements; the ropes, links, chains and connections are in good condition. They use a metal speaking tube in the mine. They have flanges of sufficient dimensions attached to the sides of hoisting drums; they have adequate breaks on hoisting drums; the boilers, feed-pipes, water-gauge cocks, etc., are in good condition; they use a steam gauge to indicate the pressure of steam per square inch; they use 2 hoisting engines=160-horse power.

Remarks.—They have furnished a map of mine; they have no house for men to wash or change their clothes in; they have second openings at Nos. 4, 5, 6 and 11 shafts and No. 2 slope, as all these works are connected together; there are no boys working in the mine under 12 years of age; they have an adequate amount of ventilation in the mine to expel therefrom all noxious or poisonous gases; the mining boss seems to be a practical, careful and competant man; he has an assistant; they examine the mine every morning before the men enter to work, and every evening to see that the mine doors are all closed; the engineers are experienced, competent and sober men; the shaft-landings are well secured by safety gates.

No. 4 Shaft.

This shaft is located in Pittston borough, and part of the workings are located in Jenkins township, 1 mile south-west of Pittston and ½ mile south-east of the Susquehanna river. This shaft is operated by the Pennsylvania coal company. This shaft is 192 feet deep; size, 16 feet by 9½ feet. Andrew Bryden is general mine superintendent, and Peter P. Daley is mining boss.

Description.—They have no breaker connected with this mine, but they have large schutes for loading large railroad cars. The coal from this mine is prepared at No. 2 breaker, Pittston, and at the screens in Dunmore; they mine about 350 tons of coal per day; they employ 52 miners, 50 laborers, 15 drivers, 2 door-boys and 8 company men, in the mine; 13 company men, 2 mechanics and 1 boss, outside; in all, 143 men and boys. They are working the 14 feet vein; average thickness, 11 feet; they work headings 10, air-ways 15, and chambers from 20 to 26 feet wide; they leave pillars from 14 to 20 feet wide to sustain the roof; they leave cross entrances from 18 to 50 feet apart for the purpose of ventilation: the roof is good slate; the mine is in a good working condition.

Ventilation.—Ventilation is produced by the action of the atmosphere; the in-take is located in main shaft; it contains an area of 95 feet; the up-casts are located in No. 7 shaft and No. 4 slope at present; they contain an area of 95 feet; the average supply of fresh air is 15,500 cubic feet per minute; the main doors on headings and air-ways are hung so that they will close of their own accord; they have attendants at all main doors to keep them shut, so as to assist the ventilation; they have double doors in main traveled roads, and an extra one in case that any of the others should get broken; the air is circulated to the face of the workings in 3 splits; they employ 52 men in one, 16 in the other and 34 in the other; the amount of ventilation has been measured and reported according to law; ventilation is good; they are putting up a new fan which is not in operation yet, the up-cast then will be in main shaft.

Machinery.—The engines in use in this colliery are 2 40-horse power and 2 10-horse power fan engines, and 2 10-horse power engines used for sinking the new slope. They have a metal speaking tube in the shaft; they have flanges of sufficient strength and dimensions for safety, attached to the sides of their hoisting drums; they have adequate breaks on their hoisting drums; the links, chains, ropes and connections, are in good condition; the boilers have been cleaned, examined and reported in good condition, according to law; they have a steam gauge and safety valves for safety and to indicate the pressure of steam.

Remarks.—They have furnished a map of the mine; they are connected with the workings of No. 7 shaft and No. 4 slope, which can be used as a second opening; they have no house for men to wash or change their clothes in; the mining boss is a practical and competant man; there are no boys working in the mine under 12 years of age; the engineers seem to be experienced, competent and sober men; they comply, generally, to the requirements of the law; the shaft-landings are portected by safety-gates.

No. 4 Slope.

This slope is located in Jenkins township, lying south-east of No. 4 shaft. It is 184 feet long, 9 feet wide and 6 feet high. It is operated by the Pennsylvania coal company. Andrew Bryden is general superintendent, and James Bryden is mining boss.

Description.—There is no breaker connected with this mine. They mine and ship about 275 tons of coal per day. They employ 40 miners, 40 laborers, 13 drivers, 6 door boys and 8 company men inside; 5 drivers, 13 company men, 2 mechanics and 1 boss outside: in all 128 men and boys. They are working two gravity planes in the mine; one is 203 and the other is 250 feet long. The vein of coal which they are working is called the Pittston or 14 feet vein. Its average thickness is 11 feet. They drive headways 10, air-ways 15, and chambers from 20 to 26 feet wide. They leave the pillars from 14 to 21 feet wide to sustain the roof. They leave cross entrances from 18 to 50 feet apart for the purpose of ventilation. The roof is slate. The mine is in a good safe working condition.

Ventilation.—The mine is ventilated by the action of the atmosphere; the intakes are located at the mouths of Nos. 3 and 4 slopes: the areas are 54 and 60 feet: the out or upcast is in No. 4 shaft in summer and at the mouth of tunnel in No. 3 slope workings in winter; area about 75 feet; the average amount of fresh air to supply the mine is 35,800 cubic feet per minute; there is no noxious poisonous or inflammable gas evolved in this mine; the main doors on headings and airways are hung so that they will close of their own accord, and they have attendants at all main doors to keep them closed so as to keep a steady current of air and conduct it to the face of the working places; the air is conducted to the face of the workings in one volume; the ventilation has been measured and reported according to law; the ventilation is tolerably good.

Machinery.—They use one hoisting engine of 20-horse power; they have a metal speaking tube in the mine; they have flanges of sufficient dimensions attached to hoisting drum for safety; they have an adequate brake on hoisting drum; the boilers, feed pipes, water gauge cocks, &c., have been cleaned and examined and reported in good condition according to law; they have a steam gauge and safety valve for the purpose of indicating the pressure of steam and for safety.

Remarks.—They have furnished a map of the mine; No. 3 slope and Nos. 4 and 11 shaft workings are connected and can be used as a second opening; they have no house for men to wash or change their clothes in; the mining boss is a practical and competent man; there are no boys working in the mines under twelve years of age; the engineer is an experienced, competent and sober man; there are no persons allowed to ride on loaded cars on the planes or in the slope. The parties having charge know their duty in case of death or serious accident.

No. 5 Slope or Grand Tunnel.

This mine is located in Pittston township, about one-fourth of a mile south-east of the Susquehanna river. This mine is opened by a slope and tunnel; the slope is about 500 feet long; it is 10 feet wide by 7 feet high; the tunnel is 500 feet long to where it connects with the slope; the opening is 7 feet wide by 6 feet high; it is operated by the Pennsylvania coal company. Wm. Law is general mine superintendent and James Watson is mining boss.

Description.—There is no breaker connected with this mine. The coal is prepared at No. 2 breaker and the screens in Dunmore; they mine about 300 tons of coal per day; they employ 38 miners, 38 laborers, 21 drivers and 12 company men in the mine, 4 drivers, 18 company men, 2 mechanics and 1 boss outside; in all 134 men and boys; they have two gravity planes in the mine, one is 180 and the other 238 feet long; they are working the Pittston vein of coal; average thickness 12 feet; the character of the workings is drawing back top coal; the headings are 10, airways 15 and chambers 24 feet wide; the pillars are from 16 to 20 feet thick to sustain the roof; the cross-entrances are about 30 feet apart for the purpose of ventilation; the roof is very good slate, and the mine is in a good working condition.

Ventilation.—Ventilation is produced by the action of the atmosphere; they have cut loose in to the old workings of the Butler coal company's mine in several places; there are a great many cave-holes to the surface in these old work-

ing, which causes the air to play backwards and forwards in the mine according to the temperature and pressure of the atmosphere outside; the ventilation is generally good.

Machinery.—They use one hoisting engine of 20-horse power; they have a metal speaking tube in the mine; the boilers have been cleaned and examined and reported in good condition; they have a steam gauge to indicate the pressure of steam.

Remarks.—They have furnished a map of their mine; they have no house for men to wash or change their clothes in; there is no noxious or poisonous gas evolved in the mine; the mining boss seems to be a practical and competent man; there are no boys working in the mine under twelve years of age; the engineer seems to be a practical, competent and sober man; they do not allow any person to ride on loaded cars on the planes in the mine; the parties having charge know their duty in case of death or serious accident.

NOTE.—Alexander Craig, Esq.. has charge of the boilers and machinery of the Pennsylvania coal company. He is a gentleman of practical experience and he has the boilers cleaned and examined and the machinery kept in good condition, so as to comply with the requirements of the mine ventilation laws of 1870.

TOMKIN'S COLLIERY.

This colliery is located in Pittston borough, and is situated directly on the east bank of the Susquehanna river. The Checkered vein is worked by a tunnel from the crop; the shaft is 130 feet deep to the 14 feet vein, (abandoned,) and it is 150 feet deep to the Third or Lower vein. It is operated by Alva Tompkins, Esq. John Hughes is mining boss and D. Davis is outside foreman.

Description.—There is a breaker connected with shaft buildings; they mine and prepare about 75 tons of coal per day; they employ in the Checkered vein 18 miners, 16 laborers, 6 drivers, 3 door-boys and 6 company men, and in the Third vein 5 miners, 7 laborers, 1 driver, 1 door-boy and 3 company men; 20 slate pickers, 3 head and plate men, 7 company men, 2 mechanics and 1 boss outside; in all, 99 men and boys. They are working a slope 75 feet long, and driven on an angle of 35 degrees; they are working the Checkered and Third vein of coal: average thickness of the Checkered is 4½, and the Third vein is 6 feet; they work headings 10, and chambers 24 feet wide; they leave pillars from 12 to 18 feet wide to sustain the roof; they leave cross entrances about 20 feet apart for the purpose of ventilation; the roof is slate and rock; the mines are in a good working condition.

Ventilation.—Ventilation in the Checkered vein is produced by means of a furnace, and in the Third vein it is produced by means of a steam jet; the intake is located in main opening, area 37 feet; the up-cast is located in furnace air-shaft, area 36 feet; the amount of pure fresh air is 9,750 cubic feet per minute; there is inflammable gas evolved in the lower vein; the mines are examined every morning before men go to work, and every evening to see that the main doors are closed; the main doors are hung so that they will close of their own accord; they have attendants at main doors; they have double doors on main traveled roads and an extra one in case of an accident to any of the others; the air is circulated to the face of the workings in 2 splits in the Checkered vein; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use 1 hoisting engine of 40-horse power, 1 pumping engine of 30-horse power, and 1 breaker engine of 15-horse power; they have a metal speaking tube in the shaft; they have 1 self-dumping carriage with an improved safety-catch, bridle chains, etc., attached to it; they have an adequate brake and flanges of sufficient strength and dimensions attached to the hoisting drums; the ropes, links, chains and connections are in good condition; the boilers have been cleaned and examined and reported in good condition; they have a steam gauge to indicate the pressure of steam.

Remarks.—They have furnished a map of mine; they have a second opening for the Checkered vein about 400 feet from main opening; they have no house for men to wash or change in; the mining boss seems to be a practical, competent man; he has a fire boss to assist him; there are no boys working in the mines under 12 years of age; the engineers seem to be experienced, competent and sober men; they do not allow any persons to ride on loaded carriages in the shaft

or loaded cars in the mines; they do not allow more than ten men to ride on the safety-carriage at one time; the parties having charge know their duty in case of death or serious accident; the shaft-landings are protected by safety-gates; they have no second opening yet in the bottom vein; the breaker machinery is fenced and boxed off so that operators are safe.

Maryland National Anthracite Colliery.

This colliery is located in Pittston township, and situate one mile south-east of the Susquehanna river. It is operated by Thomas Waddell, Esq. Thomas Waddell is general superintendent, Alexander Lauder is mining boss, and Owen Mulloy is outside foreman.

Description.—The opening to the coal consists of a shaft and two tunnels. The shaft is 270 feet deep in the Pittston bottom vein; there is a breaker connected with these mines, located on the east bank of the Susquehanna river; they mine and prepare about 100 tons of coal per day; they employ 20 miners, 20 laborers, 6 drivers, 1 door-boy and 3 company men in the mines; 15 slate pickers, 4 head and plate men, 3 drivers, 2 mechanics and 1 boss outside; in all 75 men and boys, they are working a slope inside 113 feet long and driven at an angle of 11½ degrees; they are working the Pittston bottom vein of coal; average thickness about 3½ feet; they work headings and air-ways about 12 and chambers about 24 feet wide; they leave pillars about 14 feet wide to sustain the roof; they leave cross-entrances from 30 to 50 feet apart for the purpose of ventilation; the roof is good rock; the miners are in a good, safe working condition.

Ventilation is produced by a furnace in the tunnel; the intake for shaft is located at mouth of shaft, area —feet, and the intakes for tunnels are located at mouth of tunnels, area of each 64 feet; the upcasts for shaft and tunnels are located in furnace air shaft, area 40 feet; the amount of pure air in shaft is—— cubic feet and in the tunnels it is—— cubic feet per minute; the main doors are hung so as to close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings in one volume in each place; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use one breaker engine of 25-horse power and one engine for hoisting and pumping at shaft of 80-horse power; they have a metal speaking tube in shaft; they have a safety-carriage with all the modern improvements; they have an adequate brake and flanges of sufficient strength and dimensions for safety attached to their hoisting drum: the ropes, links, chains and connections are in good condition; the boilers have been cleaned and examined and reported in good condition; they have a steam-gauge to indicate the pressure of steam; the breaker machinery is boxed and fenced off so that operatives are safe.

Remarks.—They have furnised a map of mines; they have a second opening; they have no house for men to wash or change in; the mining boss seems to be a practical and competent man; there are no boys working in the mines under twelve years of age; the engineers seems to be experienced, competent and sober men; they do not allow any persons to ride on loaded cars in the mines; they do not allow over ten men to ride on the safety-carriage at one time; the parties having charge know their duty in case of death or serious accident; the upcast for shaft is in main opening.

No. 9 Shaft.

This shaft is located in Pittston borough, lying one-fourth of a mile south-east of the Susquehanna river. It is 71 feet deep to the Checkered vein, and 136 feet deep to the Pittston or 14 feet vein; it is 12 feet wide by 16½ feet long. It is operated by the Pennsylvania coal company. Andrew Bryden is general mine superintendent and Thomas Richardson is mining boss.

Description.—The coal mined here is prepared and cleaned at No. 10 breaker, which is 2,500 feet from the shaft; they mine about 160 tons of coal per day; they employ 28 miners, 14 laborers, 4 drivers, 2 door-boys and 4 company men, in the mine; 3 head and plate men, 3 drivers, 2 company men, 3 mechanics and

1 boss, outside; in all, 64 men and boys; they are working the Pittston or 14 feet vein of coal; average thickness, 9 feet; they work headings 10, air-way 15, and chambers from 20 to 24 feet wide; they leave pillars from 14 to 18 feet wide to sustain the roof; they leave cross entrances from 18 to 50 feet apart for the purpose of ventilation; the roof is good slate; the mine is in a good safe working condition.

Ventilation.—The ventilation is produced by means of a furnace, viz: There is a brick partition in second opening and the furnace is on one side of it and steps for men to travel in on the other side; the in-take is located in main shaft; it contains an area of 100 feet; the up-cast is located in air-shaft; it contains an area of 60 feet; the average supply of fresh air is 20,000 cubic feet per minute; there is noxious, poisonous and inflamable gas evolved in the mine; the mine is examined every morning before men are allowed to go to work, and every evening to see that the main doors are all closed; the main doors are hung so that they will close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings in two splits; the amount of ventilation has been measured and reported according to law; ventilation is good.

Machinery.—They use 1 hoisting engine, 40-horse power; they have a metal speaking-tube in the shaft; they have a safety-carriage with all the modern improvements; they have flanges of sufficient strength and dimensions for safety, and an adequate brake, attached to their hoisting drums; the main links, chains and connections are in good condition; the boilers have been cleaned and examined and reported in good condition according to law; they have a steam gauge and safety-valves for safety and to indicate the pressure of steam.

Remarks.—They have furnished a map of mine; they have a second opening located 500 feet from main shaft; they have a house for men to wash and change their clothes in; the mining boss seems to be a practical and competent man; he has a fire boss to assist him; there are no boys working in the mine under 12 years of age; they do not allow any person to ride on loaded carriages in the shaft; they do not allow more than 10 men to ride on the safety-carriage at one time; the parties having charge know their duty in case of death or serious accident; the shaft-landings are protected by safety-gates; they do not work more than 50 persons in one split of air.

No. 10 Shaft Colliery.

This colliery is located in Pittston borough, and lying one-half of a mile southeast of the Susquehanna river. The shaft is 99 feet deep to the Checkered vein and 150 feet deep to the Pittston or 14 feet vein; it is 12 feet wide by 27 feet long; it is operated by the Pennsylvania coal company. Andrew Bryden is general mine superintendent and William Abbott is mining boss.

Description.—There is a double breaker connected with these mines; it is connected to the shaft tower by a trestling 50 feet long; they mine and prepare about 560 tons of coal per day; they employ 82 miners, 72 laborers, 20 drivers, 7 door-boys and 18 company men in the mines; 61 slate pickers, 14 head and plate men, 2 drivers, 14 company men, 13 mechanics and 2 bosses outside; in all 305 men and boys. The character of the workings is pillar and chamber; they are working the Checkered and Pittston veins of coal; average thickness of the Checkered is 6 and of the Pittston vein 8½ feet; they are working headings 10, air-ways 15 and chambers from 20 to 26 feet wide; they leave pillars from 14 to 18 feet wide to sustain the roof; they leave cross-entrances from 18 to 50 feet apart for the purpose of ventilation; the roof is good slate; the miners are in good working condition; they are working a slope in the Checkered vein.

Ventilation.—The ventilation in the Checkered vein is produced by a furnace and in the Pittston vein by the action of the atmosphere; the intake is located in the main shaft for the Checkered vein, and in No. 8 shaft and second opening for the Pittston or 14 feet vein; the upcast for the Checkered vein is in the furnace air shaft, and for the Pittston or 14 feet vein in No. 8 shaft in winter and in No. 3 shaft in summer; the amount of fresh air in the Checkered vein is 23,000 and in the Pittston or 14 feet vein 23,000 cubic feet per minute; the main doors on headings and air-ways are hung so that they will close of their own accord; they have an attendant at main doors; the air is conducted to the face of the

workings in a systematic manner; the amount of ventilation has been measured and reported according to law; ventilation is good.

Machinery.—The engines in use in this colliery are one hoisting engine of 40-horse power, one pumping and hoisting engine of 40-horse power, one breaker engine of 40-horse power, one steam pump of 30-horse power and one slope engine of 30-horse power. They have two metal speaking tubes in the shaft; they have a safety carriage with all the modern improvements on it; they have flanges of sufficient strength and dimensions for safety and an adequate brake attached to the sides of the hoisting drums; the ropes, links, chains and connections are in good condition; the boilers have been cleaned and examined and reported in good condition according to law; they have a steam-gauge and safety valves for safety and to indicate the pressure of steam.

Remarks.—They have furnished a map of the mines; they have second openings for both veins located at various distances from the main opening; they have a house for men to wash and change their cloths in; the mining boss seems to be a practical and competent man; there are no boys working in the mines under twelve years of age; the engineers seem to be experienced, competent and sober men; they do not allow any person to ride on loaded cars in the shaft or on the slope; they do not allow more than ten men to ride on the safety carriage at one time; the parties having charge know their duty in case of death or serious accident; they have four hoisting carriages in the shaft, two to each vein; they have two safety-carriages with all the modern improvements, one to each vein; they have a man and mule way from the surface to both veins; all parties working in the mines go in and out by this passage; the shaft landings are protected by safety-gates; the breaker machinery is fenced and boxed off so that operatives are safe.

No. 2 Breaker, Pittston.

This breaker is located in Pittston borough, at the head of No. 2 plane. They break, screen and prepare the coal here from the different shafts around Pittston that have no breaker connected with them; they employ 38 slate pickers and 14 men; in all 52 men and boys.

No. 8 Shaft Colliery.

This shaft is located in Pittston township, and lying 1 mile south-east of the Susquehanna river; it is 68 feet deep to the Checkered vein, and 136 feet deep to the Pittston or 14 feet vein; size of shaft is 14 feet long and 9½ wide. This mine is operated by the Pennsylvania coal company. Andrew Bryden is general mine superintendent and James Moffatt is mining boss.

Description.—There is a breaker connected with this mine about 400 feet north of the shaft; they mine and prepare about 450 tons of coal per day—350 tons from the shaft and 100 tons from No. 6 slope; they employ 52 miners, 47 laborers, 13 drivers and 7 company men, in the mine; 42 slate pickers, 12 head and plate men, 2 drivers, 13 company men, 5 mechanics and 2 bosses, outside; in all 195 men and boys. This mine is worked by 4 planes and 1 slope; 1st plane is 400, 2d plane 230, 3d plane 300, and 4th plane 440 feet long; the slope is 440 feet long. The character of the workings: They drive headings and air-ways at water level, and they open chambers off the air-ways to the pitch; they are working the Pittston vein of coal; average thickness, 10 feet; they work headings 10, air-ways 15 and chambers from 20 to 24 feet wide; they leave pillars from 14 to 18 feet to sustain the roof; they leave cross entrances from 20 to 50 feet apart for the purpose of ventilation; the roof is good slate; the mine is in a good working condition.

Ventilation.—Ventilation is produced by the action of the atmosphere; the intake is located at shafts Nos. 10 and 3 in the winter time, and in No. 6 slope and main shaft in the summer time; the intake in Nos. 10 and 3 shafts each contain an area of 100 feet; the area of main shaft is 100 feet, and No. 6 slope contains an area of 54 feet; the average supply of fresh air is 20,650 cubic feet per minute;

the main doors on headings and air-ways are hung so that they will close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings in four splits; the amount of ventilation has been measured and reported according to law; ventilation is good.

Machinery.—The engines in use at this colliery are one pair of hoisting engines of 40-horse power, one breaker engine of 30-horse power and one donkey engine in mine for pumping purposes, &c.; they have a metal speaking tube in the shaft: they have a safety carriage with all the modern improvements; they have flanges of sufficient strength and dimensions for safety; they have an adequate brake on the hoisting drums; the main links, chains and connections are in good condition: the boilers have been cleaned and examined and reported in good condition; they have a steam-gauge and safety-valves for safety and to indicate the pressure of steam; the breaker machinery is boxed and fenced off so that operatives are safe.

Remarks.—They have furnished a map of the mine; they have second openings located at various distances from the main opening; they have no house for men to wash or change clothes in; the mining boss seems to be a practical and competent man; there are no boys working in the mine under twelve years of age; the engineers seem to be experienced, competent and sober men; they do not allow any person to ride on loaded cars on the planes in the mine; they do not allow more than ten men to ride on the safety-carriage at one time: the parties having charge know their duty in case of death or serious accident; the shaft landings are protected by safety-gates.

No. 6 Slope.

This slope is located in Pittston township, and lying about 600 feet south-east of No. 8 shaft; it is 900 feet long, 6 feet high and 10 feet wide; it is operated by the Pennsylvania coal company. Andrew Bryden is general mine superintendent and James Moffat is mining boss.

Description.—There is a breaker connected with this mine about 1,200 feet away; they mine and prepare about 100 tons of coal per day; they employ 22 miners, 13 laborers, 3 drivers and 2 company men in the mine, 2 drivers, 3 company men and 3 mechanics outside, in all 48 men and boys; they are working the 7 feet vein of coal; average thickness 6 feet; they work headings 10, air-ways 15 and chambers from 20 to 26 feet wide; they leave pillars from 14 to 18 feet wide to sustain the roof; they leave cross-entrances from 18 to 50 feet apart for the purpose of ventilation; the roof is good slate; the mine is in a good working condition.

Ventilation.—Ventilation is produced by the action of the atmosphere: the intake is located in No. 10 shaft and No. 6 tunnel; it contains an area of 100 feet at No. 10 shaft and an area of 36 feet at the drift or slope; the outcast is located at mouth of slope; it contains an area of 54 feet; the average supply of fresh air is 19,670 cubic feet per minute.the main doors are hung so that they will close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings in two splits; the amount of ventilation has been measured and reported according to law. Ventilation is good.

Machinery.—They use two hoisting engines of 20-horse power each and one steam pump of 25-horse power; they have a metal speaking tube in the mine; they have flanges of sufficient strength and dimensions for safety attached to the sides of their hoisting drum; they have an adequate brake on their hoisting-drum: the ropes, links, chains and connections are in good condition; the boilers have been cleaned and examined and reported in good condition according to law; they have a steam-gauge and safety-valves for safety and to indicate the pressure of steam.

Remarks.—They have furnished a map of their mine; they have second openings located at various distances from main opening; they have no house for men to wash or change their clothes in; the mining boss seems to be a competent and practical man; there are no boys working in the mine under twelve years of age: the engineers seem to be experienced, competent and sober men; they do not allow any person to ride on loaded wagons or cars in the slope; the persons having charge know their duty in case of death or serious accident.

Seneca Colliery.

This colliery is located in Pittston borough, and situated one-fourth of a mile south-east of the Susquehanna river. The opening consists of a slope three hundred and thirty feet long, driven at an angle of 19°; the opening is 6 by 8 feet; it is operated by the Pittston and Elmira coal company. Jos. Cool is general mine superintendent and Israel Watkins is mining boss.

Description.—There is a breaker connected with these mines, situated about three hundred feet away; they mine and prepare about three hundred and twenty-five tons of coal per day; they employ 33 miners, 33 laborers, 23 drivers, 6 door-boys and 22 company men in the mines; 27 slate pickers, 4 head and plate men, 3 drivers, 11 company men, 4 mechanics and 1 boss outside; in all 167 men and boys; there is a plane in operation in the mines; length 220 feet. They are working the Pittston and Checkered veins; average thickness of the Pittston 10 feet, and of the Checkered 6½ feet; they work headings 10, air-ways from 12 to 15, and chambers 24 feet wide; they leave pillars in each vein about 15 feet wide to sustain the roof; they leave cross-entrances in the Pittston about 30 feet, and in the Checkered vein about 25 feet apart, for the purpose of ventilation; the roof is 3 feet of slate next the coal and the rest is good rock. The mines are in a good working condition.

Ventilation.—Ventilation in the Checkered vein is produced by means of a furnace, and in the Pittston vein it is produced by the action of the atmosphere; the intake for both veins is located in main opening; the outcast for the Checkered vein is located in furnace air shaft; the outcast for the Pittston vein is located in Ravine shaft; the area of the intake is forty-eight feet and the area of the outcast is twenty-six feet; the amount of pure air is 25,000 cubic feet per minute; there is some inflammable gas evolved in the mines; the mines are examined every morning before men go to work and every evening to see that the main doors are all closed; the main doors are hung so that they will close of their own accord; they have attendants at the main doors; they have double doors on main traveled roads and an extra one in case of an accident to any of the others; the air is circulated to the face of the workings in one volume in both veins; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use one breaker engine of 30-horse power and one hoisting engine at the slope of 40-horse power; they have flanges of sufficient strength and dimensions attached to their hoisting drums; the boilers have been cleaned and examined and reported in good condition; they have a steam-gauge to indicate the pressure of steam.

Remarks.—They have furnished a map of the mines; in the Pittston vein they are connected with Ravine shaft, which can be used as a second opening, and the second opening for the Checkered vein is located sixteen hundred feet from the main opening; they have no house for men to wash or change their clothes in; the mining boss seems to be a practical and competent man; there are no boys working in the mines under twelve years of age; the engineers seem to be experienced, competent and sober men; they do not allow any person to ride on loaded cars in the mines; the parties having charge know their duty in case of death or serious accident; the breaker machinery is fenced and boxed off so that operatives are safe.

Ravine Colliery.

This colliery is located in Pittston brrough, and is situated one thousand feet south-east of the Susquehanna river; the opening consists of a shaft; it is eighty feet deep to the Checkered and one hundred and fifty feet deep to the Pittston vein; the opening is ten by sixteen feet; it is operated by the Pittston and Elmira coal company. Jos. Cool is general mining superintendent and Israel Watkins is mining boss.

Description.—There is a breaker over the shaft; they mine and prepare about three hundred tons of coal per day; they employ in the Pittston vein 10 miners, 10 laborers, 7 drivers, 2 door-boys and 6 company men, and in the Checkered vein 18 miners, 18 laborers, 7 drivers, 4 door-boys and 8 company men; 27 slate pickers, 6 head and plate men, 6 drivers, 12 company men, 5 mechanics and 1 boss outside; in all 147 men and boys; they are working a slope in the Checkered vein 250 feet long; they are working the Pittston and Checkered veins; average thickness of

the Pittston 10 feet, of the Checkered vein 6½ feet; they work headings 10, airways 12 and chambers about 24 feet wide; they leave pillars about 15 feet wide to sustain the roof; they leave cross entrances twenty-five feet apart in the Pittston vein and thirty feet in the Checkered vein, for the purpose of ventilation; the roof contains about three feet of slate and the rest is solid rock; the mines are in a good working condition.

Ventilation.—Ventilation in the Checkered vein is produced by a furnace and in the Pittston vein by the action of the atmosphere. The intake is located on the main shaft for both veins; the area of intake is 160 feet; the upcast for the Checkered vein is in Furnace air shaft; the Pittston vein is connected with the Seneca slope; when the Seneca slope is the intake the main shaft is outcast; it reverses according to the temperature outside; the amount of pure fresh air is 18,000 cubic feet per minute; there is a little noxious gas evolved in the mines; the mines are examined every morning before men go to work and every evening to see that the main doors are all closed; the main doors are hung so that they will close of their own accord; they have attendants at main doors; they have double doors on main traveled roads and an extra one in case of an accident to any of the others; the air is circulated to the face of the workings in one split in each vein; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use one hoisting engine of 60-horse power and one breaker engine of 20-horse power; they have a metal speaking tube in the shaft; they have flanges of sufficient strength and dimensions for safety attached to the hoisting drums; the ropes, links, chains and connections are in good condition; the boilers have been cleaned and examined, and reported in good condition; they have a steam-gauge to indicate the pressure of steam.

Remarks.—They have furnished a map of the mines; the second opening for the Checkered vein is located about 200 feet from the main opening; they have a house for men to wash and change clothes in; the mining boss seems to be a practical and competent man; he has a fire boss to assist him; there are no boys working in the mines under twelve years of age; the engineers seem to be experienced, competent and sober men; the men walk in and out Seneca slope; the parties having charge know their duty in case of death or serious accident; the shaft landings are protected by safety gates; the breaker machinery is fenced and boxed off so that operatives are safe.

Beaver Mines or Morgan's Slope.

This colliery is located in Pittston borough, and situated about 2,000 feet southeast of the Susquehanna river. It was once a slope but is now a tunnel; it is operated by Beaver & Co., Danville. Daniel Edwards is general superintendent, Fred. Burget is mining boss and D. Davis is outside foreman.

Description.—There is a small breaker located about 150 feet from the mouth of the tunnel; they mine and prepare about 80 tons of coal per day; they employ 9 miners, 9 laborers, 5 drivers, 3 door boys and one company man in the mine; 2 slate pickers, 5 company men, 1 mechanic and 1 boss, outside; in all 36 men and boys; this mine is worked by one plane inside about 350 feet long; they are working the Checkered vein; average thickness 6½ feet; they work headings 15, airways 18 and chambers 24 feet wide; they leave pillars about 12 feet wide to sustain the roof; they leave cross-entrances about 15 feet apart for the purpose of ventilation; the roof is good; the mine is in a good working condition; this mine is nearly worked out; they are getting coal wherever they can without any reference to system.

Ventilation is produced by the action of the atmosphere; ventilation is tolerably good.

Machinery.—There is no machinery required except for running the screens, &c. They use one breaker engine of 20-horse power.

Rock Hill Tunnel

Is located in the borough of Pittston, and is situated 1,000 feet south-east of the Susquehanna river. It is operated by Bowkly & Son. Robert Sharp is general superintendent, Benjamin Lloyd is mining boss and Abram Price is outside foreman.

Description.—There is a breaker located about 500 feet from the mouth of the tunnel; they mine and prepare about 85 tons of coal per day; they employ 11 miners, 11 laborers and 4 drivers in the mine; 9 slate pickers, 4 head and plate men, 1 driver, 6 company men, 1 mechanic and 1 boss outside; in all 48 men and boys; they are working the Checkered vein; average thickness 7 feet; they work heading 12, air-ways 10 and chambers 24 feet wide; they leave pillars from 10 to 15 feet wide to sustain the roof; they drive cross-entrances as often as necessary for the purpose of ventilation; the roof is very good; the mine is in a tolerably good working condition.

Ventilation is produced by the action of the atmosphere; they are connected with Beaver & Co.'s mine, and one acts as an outcast for the other.

Machinery.—They use one engine of 25-horse power to operate the breaker; there is no machinery required at the mine.

Remarks.—They have furnished a map of the mine; there are no boys allowed to work in the mine under twelve years of age; the parties having charge know their duty in case of death or serious accident.

Twin Shaft Colliery.

This colliery is located in Pittston borough, and situated on the east bank of the Lackawanna river; it is operated by the Pittston and Elmira coal company. Jos. Cool is general superintendent, Thomas Smiles is mining boss and S. H. Huntington is outside foreman.

Description.—These mines are opened by two shafts twenty feet apart; they are 65 feet deep to the Checkered and 110 feet deep to the Pittston vein; there is a breaker attached to the shaft tower; they mine and prepare about 280 tons of coal per day; they employ 22 miners, 22 laborers, 14 drivers, 5 door-boys and 12 company men in Pittston vein; 7 miners, 7 laborers, 2 drivers, 1 door-boy and 1 company man in Checkered vein; 27 slate pickers, 5 head and plate men, 2 drivers, 7 company men, 3 mechanics and 1 boss outside; in all 138 men and boys; they are working the Pittston and Checkered veins; the average thickness of the Pittston vein is 8 feet and of the Checkered vein 6 feet; they work headings 10, air-ways 15 and chambers 24 feet wide; they leave pillars about 15 feet wide to sustain the roof; they leave cross-entrances about 30 feet apart for the purpose of ventilation; the roof is three feet of slate and good rock above; the mines are in a good working condition.

Ventilation in both veins is produced by means of a steam jet; the intake is located in the shaft where they hoist coal; area 100 feet; the upcast is located in the shaft that is used for hoisting men and supplies into and out of the mines; area 100 feet; the amount of pure fresh air is 15,200 cubic feet per minute; there is some inflammable and noxious gas evolved in the Pittston vein; the mines are examined every morning and evening by the fire boss; they have double doors on traveled roads and an extra one in case of accident to any of the others, and the main doors are hung so that they will close of their own accord; they have attendants at main doors; the amount of ventilation has been measured and reported; the air is conducted to the face of the workings systematically by the aid of check doors; there is but very little inflammable gas in the mines except when a door or gate gets broken, and then not to any dangerous extent; ventilation is good.

Machinery.—They use one hoisting engine of 60-horse power; one pumping engine of 40-horse power, and one breaker engine of 10-horse power; they have a metal speaking tube in the shaft; they have one patent safety-carriage with all the modern improvements in the shaft used for hoisting and lowering men and supplies; they have lately put on a new wire rope and attachments, which are safe and in good condition; they do not allow any person to ride on loaded carriages in the shaft; they do not allow over ten persons to ride on the safety-carriage at one time; the boilers have been cleaned and examined and reported in

good condition; they have flanges of sufficient strength and dimensions for safety attached to their hoisting drums; they have an adequate brake on the hoisting drum; they have a steam-gauge and safety-valves for safety and to indicate the pressure of steam; the breaker machinery is boxed and fenced off so that operatives are safe.

Remarks.—They have furnished a map of the mines; they have second openings for both veins; the Checkered vein is connected with Rock Hill Tunnel workings, and they have a shaft with ladders in from the Pittston vein to the surface; it is located about 1,500 feet south of main shaft; they have a house for men to wash and change in; they have no standing gas or water in the mines; the mining boss is a practical and competent man; he thoroughly understands his business; there are no boys working in the mines under twelve years of age; the engineers seem to be experienced, competent and sober men; the parties having charge know their duty in case of death or serious accident; the shaft landings are protected by safety-gates.

Rough and Ready Shaft Colliery.

This colliery is located in Pittston township, and situated on the east bank of the Lackawanna river. This mine is operated by the National iron company of Danville. Elijah Evans is superintendent and mining boss.

Description.—This shaft is 35 feet from the surface to the Checkered vein; then 7 feet of coal; then 35 feet of rock to the Pittston vein; then 12 feet of coal; then 98 feet of rock to the vein they now propose to work; they had a breaker attached to the shaft tower, but it was burned down during the year; they are not working here at present; they mined only about 5,000 tons of coal during the year 1872, as they have been idle a greater portion of the time; the average thickness of the vein of coal that they propose to work is about 8 feet; the Pittston and Checkered veins are nearly worked out; they are now preparing to build a new breaker and they say that they will get the mines in good working condition.

Columbia Tunnel.

This colliery is located in Pittston township, and situated about ¼ mile southeast of the Lackawanna river. It is operated by Grove Brothers, Danville. Daniel Evans is general superintendent and mine boss, and Evan J. Evans is outside foreman.

Description.—The opening to the coal is a tunnel 7 feet wide by 6 feet high and 2,300 feet long to the face in the mine; there is a breaker located about 500 feet from mouth of tunnel; they mine and prepare about 90 tons of coal per day; they employ 10 miners, 10 laborers, 3 drivers, 2 door-boys and 1 company man in the mine; 6 slate pickers, 2 head and plate men, 1 driver, 2 company men, 3 mechanics and 2 bosses outside; in all 42 men and boys; they are working the Pittston vein; average thickness, 8 feet; they work headings 10, air-ways 14, and chambers 24 feet wide; they leave pillars about 14 feet wide to sustain the roof; they leave cross entrances about 20 feet apart for the purpose of ventilation; the roof is fire-clay and slate; the mine is in good working condition.

Ventilation is produced by a furnace aided by check-doors; the in-take is located at mouth of tunnel; area 42 feet; the up-cast is located in furnace air-shaft; area 25 feet; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use 1 breaker engine of 30-horse power.

Remarks.—The mining boss seems to be a practical and competent man; there are no boys working in the mine under 12 years of age.

Butler Colliery.

This colliery is located in Pittston township and situated about two miles south-east of the Susquehanna river; it is operated by the Butler coal company. S. B. Bennett is general superintendent, Thos. Tetley mining boss and Robert Jaques outside foreman.

Description.—These mines are opened by a shaft and tunnels; the shaft is 67 feet to the Pittston and 106 feet deep to what they call the Butler vein; there is a double breaker attached to the shaft tower; they mine and prepare about 85 tons of coal per day; they employ 26 miners, 26 laborers, 10 drivers, 2 door-boys and 7 company men in the mines; 24 slate pickers, 6 head and plate men, 3 drivers and 8 company men, 6 mechanics and 2 bosses outside; in all 120 men and boys; they work one plane in the Pittston vein 250 feet long; the character of workings is drawing back top coal and robbing pillars in the Pittston vein, and in the Butler vein is driving headings and airways for opening up the mines; the shaft has been sunk to this vein since my last report; the average thickness of the Pittston is 14 and the Butler 8 feet; they work headings 10, air-ways 15 and chambers 25 feet wide; they leave pillars about 16 feet wide to sustain the roof; they leave cross-entrances about 20 feet apart for the purpose of ventilation; the roof is good slate and rock; the two veins are in tolerable good working condition.

Ventilation.—In the Pittston vein it is produced by the action of the atmosphere; there are several cave-holes in the surface which cause the ventilation in these mines to be good; ventilation in the Butler vein is produced by a fan; the intake for the Butler vein is located in the shaft; the air is conducted to the face of the workings by the aid of check-doors; the upcast is in the partition on the north side of main shaft; the area of the intake is 100 feet and the upcast 26 feet; the amount of pure fresh air is 13,800 cubic feet; there is no inflammable gas evolved in the mines; the main doors are hung so that they will close of their own accord; they have attendants at main doors; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use two hoisting engines of 40-horse power each, and one of "Knowles and Silsby's" donkey pumps in the mines; they have a metal speaking tube in the mines; they have two self-dumping hoisting carriages with an improved safety-catch, bridle, chains, &c., attached to them; the ropes, links, chains and connections are in good condition; the boilers have been cleaned and examined and reported in good condition; they have a steam-gauge to indicate the pressure of steam.

Remarks.—They have furnished a map of the mines; the miners, laborers, &c., walk in and out the man and mule way driven from the Butler vein to the surface, as they are not allowed to go up or down the shaft; the men wash and change their clothes in the engine room; the mining boss seems to be a practical and competent man; there are no boys working in the mines under twelve years of age; the engineers seem to be experienced, competent and sober men; the parties having charge know their duty in case of death or serious accident; the shaft landings are protected by safety-gates; the breaker machinery is fenced and boxed off so that operatives are safe.

Ontario Colliery.

This colliery is located on Little Mill Creek, in Pittston township, and situated 2 miles south-east of the Lackawanna river and on the Lehigh and Susquehanna railroad. The coal mined at this colliery is shipped by the Lehigh Valley railroad company; they have built a railroad from Pittston to this colliery. These mines are operated by the Luzerne coal and iron company. Fred. Mercur is general superintendent, Chas. Smith is mining boss, and Jos. L. Cakes is outside foreman.

Description.—The openings to the coal are 2 tunnels, namely: North and South: there is a breaker located about 300 feet east of North tunnel; they mine and prepare from 300 to 400 tons of coal per day; they employ 50 miners, 40 laborers, 15 drivers and 10 company men in the mines; 40 slate pickers, 2 drivers, 40 company men, 2 mechanics and 2 bosses outside; in all 201 men and boys; they are working what is supposed to be the same vein that they are working in the Rough and Ready and Butler shafts; average thickness 10 feet; they work

headings 12, air-ways 10, and chambers about 20 feet wide; they leave pillars about 15 feet wide to sustain the roof; they drive cross-entrances whenever it is necessary for the purpose of ventilation; the roof is good rock; the mines are in a good working condition.

Ventilation.—The ventilation is produced by the action of the atmosphere and it is assisted by grates, when necessary; the in-takes are located at mouths of tunnels, areas 54 by 54 feet; the up-casts are in air shafts, areas 36 by 40 feet; the amount of pure, fresh air is 12,200 cubic feet per minute; the main doors are hung so that they will close of their own accord; they have attendants at main doors; the ventilation has been measured and reported; ventilation is good.

Machinery.—They use 3 engines at the breaker; their boilers have been cleaned and examined and reported in good condition; they have a steam gauge to indicate the pressure of steam; there is no machinery required at the tunnels.

Remarks.—They have furnished a map of mine; they have second openings for both tunnels; they have no house for men to wash and change in; the mining boss is a practical and competent man; there are no boys working in the mines under 12 years of age; the engineers seem to be experienced, competent and sober men; the parties having charge know their duty in case of death or serious accident. The breaker machinery is fenced and boxed off so that operatives are safe.

Enterprise Colliery.

This colliery is located in Pleasant Valley borough, in Pittston township. It is —— feet to first, 80½ feet to the second, and 105 feet deep to the third vein. It is operated by the Hillside coal and iron company. William M'Culloch is general mine superintendent; W. E. Colborn is mining boss; and J. W. Patten is outside foreman.

Description.—There are two breakers attached to the shaft tower; they mine and prepare about 500 tons of coal per day; they employ 41 miners, 50 laborers, 8 drivers, 6 door boys, and 10 company men in the mine; 40 slate pickers, 10 head and plate men, 3 drivers, 10 company men, 3 mechanics and 2 bosses outside; in all 183 men and boys; they have a slope in operation in the mine; it is 650 feet long, and driven at an angle of 5 degrees; they are working what is supposed to be the Stark vein, average thickness 6½ feet; they work headings 12, air-ways 15, and chambers about 25 feet wide; they leave pillars 12 feet wide to sustain the roof; they leave cross-entrances about 50 feet apart for the purpose of ventilation; the roof is rock; the mine is in a good working condition.

Ventilation.—Ventilation is produced by means of a steam jet; the intake is located in main shaft, area 130 feet; the outcast is located in second opening, area 53 feet; the amount of fresh air is 9,300 cubic feet per minute; the main doors on headings and air-ways are hung so as to close of their own accord; they have attendants at main doors; they have double doors on main traveled roads, and an extra one in case that any of the others get broken; the air is circulated to the face of the workings in one volume; the amount of ventilation has been measured and reported according to law; ventilation is good.

Machinery.—They use two hoisting engines 60-horse power each; one breaker engine at breaker No. 1, 25-horse power; and one at No. 2 breaker 60-horse power; one inside of the mine 15-horse power; they have a metal speaking tube in the shaft; they have a safety carriage, with all the modern improvements; they have an adequate brake and flanges of sufficient strength and dimensions for safety attached to their hoisting drum; the ropes, links, chains and connections are in good condition; the boilers have been cleaned and examined and reported in good condition; they have a safety valve to indicate the pressure of steam.

Remarks.—They have furnished a map of mine; they have a second opening located 300 feet from main opening; they have a house for men to wash and change their clothes in; the mining boss seems to be a practical and competent man; there are no boys working in the mine under twelve years of age; the engineers seem to be experienced, competent and sober men; they do not allow any persons to ride on loaded cars in the mines; they do not allow more than ten men to ride on the safety carriage at one time; the parties having charge know their duty in case of death or serious accident; there is a slope about 300 feet from the shaft; it is driven to the top vein, and there is a man and mule way from there to the lower vein; the shaft landings are protected by safety gates.

Enterprise Colliery Drift.

This colliery is located in Pleasant Valley borough, Pittston township; it is 500 feet long and 6 feet high by 5 feet wide; it is operated by the Hillside coal and iron company. Wm. M'Collough is general mine superintendent, W. E. Colbourn is mining boss and Jos. W. Patten is outside foreman.

Description.—The coal mined here is prepared at the Enterprise breaker; they employ 15 miners, 18 laborers, 3 drivers, 3 door-boys and 2 company men in the mine; in all 41 men and boys; they are working what is called the Brown vein; average thickness 12 feet; they work headings 12, air-ways 12 and chambers 24 feet wide; they leave pillars 12 feet wide to sustain the roof; they leave cross-entrances about 80 feet apart for the purpose of ventilation; the roof is bony coal; the mine is in a good working condition.

Ventilation is produced by means of a furnace about 400 feet from main opening; the intake is located at mouth of tunnel, area 60 feet; the upcast is located in furnace air-shaft, area 49 feet; the amount of fresh air is 4,500 cubic feet per minute; the main doors are hung so that they will close of their own accord; they have attendants at main doors; they have double doors on main traveled roads and an extra one in case of an accident to the others; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They are connected with Enterprise colliery shaft; therefore they do not need any machinery, as the mine drains itself.

Remarks.—They have furnished a map of mine; they have a second opening in furnace air-shaft; they have a house for men to wash and change their clothes in; there are no boys working in the mine under twelve years of age; the parties having charge know their duty in case of death or serious accident; they are using one breaker here where the coal is washed and cleaned and the slate is picked by machinery; they say it gives satisfaction; the breaker machinery is fenced and boxed off so that operatives are safe.

No. 12 Shaft.

This shaft is located in Little York, Pleasant Valley borough, lying about one and one-fourth of a mile south-east of the Lackawanna river. It is a new shaft, sinking by the Pennsylvania coal company; they are also building a new breaker in connection with this and No. 13 shaft, which they are also sinking; it is located in Pleasant Valley borough and they are sinking it to form a connection with the Stark colliery workings and for a second opening for No. 12 shaft.

Brown's Colliery Tunnel.

This tunnel is located in Pleasant Valley borough, about one and one-half miles south of the Lackawanna river and close to Spring Brook creek; it is operated by the Pennsylvania coal company. William Law is general mine superintendent, and James Young is mining boss.

Description.—The coal mined at this tunnel is prepared at Brown's colliery breaker, which is located about 800 feet east of the mouth of the tunnel; they mine about 200 tons of coal per day; they employ 39 miners, 21 laborers, 10 drivers, 3 door-boys and 11 company men in the mine; 2 drivers, 7 company men, 1 mechanic and 1 boss outside—in all 95 men and boys; they are working two slopes inside; one is 200 feet and the other about 150 feet long; they do not use any steam machinery to hoist coal up these slopes; they are working the Brown colliery vein; average thickness, 8½ feet; they work headings 10, air-ways 15 and chambers 26 feet wide; they leave pillars from 14 to 18 feet wide to sustain the roof; they leave cross-entrances from 18 to 30 feet apart for the purpose of ventilation; the roof is good slate; the mine is in a tolerably good working condition.

Ventilation.—Ventilation is produced by the action of the atmosphere, assisted by a furnace when necessary; the intake is located at mouth of tunnel; area is 60 feet; the outcast is in furnace air-shaft; the area is 50 feet; the average

supply of fresh air is 12,400 cubic feet per minute; the air is circulated to the face of the workings by the aid of check doors; the main doors are hung so as to close of their own accord; they have attendants at main doors.

The amount of ventilation has been measured and reported according to law. Ventilation is generally good.

Machinery.—There is no machinery connected with this mine except two hand pumps.

Remarks.—They have furnished a map of mine; they have no house for men to wash or change their clothes in; there is no inflammable gas evolved in this mine; the mining boss seems to be a practical and competent man; there are no boys working in the mine under 12 years of age; the parties having charge know their duty in case of death or serious accident.

Dawson Shaft—Brown's Colliery.

This shaft is located in Pleasant Valley borough, about one and one-half miles south of the Lackawanna river; it is 147 feet deep to the Powder Mill vein; it is 12 feet wide by 16½ feet long; it is operated by the Pennsylvania coal company. William Law is general mine superintendent, James Young is mining boss, and G. M. Snyder is outside foreman.

Description.—There is a double breaker connected to the shaft by a trestling 100 feet long; all the coal mined at Brown's colliery tunnel and at this shaft is cleaned and prepared here; they mine about 300 tons of coal per day: they employ 46 miners, 46 laborers, 10 drivers, 4 door boys and 5 company men in the mine; 22 slate pickers, 4 head and plate men, 2 drivers, 2 mechanics and one boss outside; in all 142 men and boys; they are working the Powder Mill vein of coal, average thickness 7 feet; they work headings 10, air-ways 15, and chambers 30 feet wide; they leave pillars from 15 to 21 feet wide to sustain the roof; they leave cross-entrances from 18 to 30 feet apart for the purpose of ventilation: the roof is of very good sandstone rock; the mine is in a good working condition.

Ventilation.—Ventilation is produced by the action of the atmosphere; the intake is located in main shaft in summer and the out-cast in Stark shaft, and in winter the in-take is located in Stark shaft and Powder Mill tunnel and the out-cast in Dawson shaft; the area of Dawson shaft equals 192 feet and the area of Stark shaft equals 192 feet and that of Powder Mill tunnel equals 80 feet; the amount of fresh air is 16,800 cubic feet per minute; they have no noxious or poisonous gases evolved in the mine; the main doors are hung so that they will close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings in 2 splits; the amount of ventilation has been measured and reported according to law; ventilation is good.

Machinery.—They use 2 hoisting engines of 40-horse power each, and 1 breaker engine of 30-horse power at Dawson shaft; they have a metal speaking-tube in the shaft; they have a safety-carriage with all the modern improvements on it; they have flanges of sufficient strength and dimensions for safety and an adequate brake attached to the hoisting drums; the ropes, links, chains and connections are in good condition; the boilers have been cleaned and examined and reported in good condition according to law; they have a steam gauge to indicate the pressure of steam.

Remarks.—They have furnished a map of the mine; they are connected with Stark shaft which can be used as a second opening; they have no house for men to wash or change their clothes in; the mining boss seems to be a practical and competent man; they have no boys working in the mine under 12 years of age; the engineers seem to be experienced, competent and sober men; they do not allow any person to ride on loaded carriages in the shaft; they do not allow more than 10 men to ride on the safety-carriage at one time; the parties having charge know their duty in case of death or serious accident; the shaft-landings are protected by safety-gates; the breaker machinery is fenced and boxed off so that operatives are safe.

Stark's Colliery.

This colliery is located in Lackawanna township; it is one-half of a mile south of the Lackawanna river; the opening to the coal is a shaft; it is 108 feet deep to what is called the Powder Mill vein; it is 12 feet wide by 16½ feet long; it is operated by the Pennsylvania coal company. William Law is general mine superintendent, Alexander Laird is mining boss, and F. J. Boone is outside foreman.

Description.—There is a double breaker connected to the shaft by a trestling 100 feet long; they mine and prepare about 350 tons of coal per day; they employ 64 miners, 33 laborers, 13 drivers, 5 door-boys and 8 company men in the mine; 29 slate packers, 3 head and plate men, 1 driver, 17 company men, 5 mechanics and 1 boss outside, in all 179 men and boys; this mine is operated inside by a plane 500 feet long and a slope 1,000 feet long; they are working the Powder Mill vein; average thickness, 8 feet; they work headings 10, air-ways 15 and chambers 30 feet wide; they leave pillars from 16 to 25 feet wide to sustain the roof; they leave cross-entrances from 18 to 30 feet apart for the purpose of ventilation; the roof is slate and rock; the mine is in a good working condition.

Ventilation.—Ventilation is produced by the action of the atmosphere, and assisted by steam when necessary; the intakes are located in the main shaft and Powder Mill tunnel in winter, and in the Dawson shaft in summer; the main shaft contains an area of 192 feet, Powder Mill tunnel 80 feet and Dawson shaft 192 feet; the mines are ventilated right the reverse in summer from what they are in winter; the amount of fresh air is 31,200 cubic feet per minute; the main doors on headings and air-ways are hung so that they will close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings in two splits; the amount of ventilation has been measured and reported according to law; ventilation is good.

Machinery.—They use 3 steam engines for hoisting and pumping, 80-horse power, and 1 breaker engine, 300-horse power; they have a metal speaking tube in the shaft; they have a safety carriage, with all the modern improvements. They have flanges of sufficient strength and dimensions for safety, and an adequate brake on the hoisting drums; the ropes, links, chains and connections are in good condition; the boilers have been cleaned and examined and reported in good condition, according to law; they have a steam gauge to indicate the pressure of steam.

Remarks.—They have furnished a map of mine; they are connected with the Dawson shaft, which can be used as a second opening; they have no house for men to wash or change their clothes in; the mining boss seems to be a practical and competent man; there are no boys working in the mine under 12 years of age; the engineers seem to be experienced, competent and sober men; they do not allow any persons to ride on loaded cars on the slope or in the shaft; they do not allow more than 10 men to ride on the safety carriage at one time; the parties having charge know their duty in case of death or serious accident; the shaft landings are protected by safety gates; the breaker machinery is fenced and boxed off so that operatives are safe.

Spring Brook Colliery.

This colliery is located in Lackawanna township and situated on Spring Brook creek, 1,500 feet south of the Lackawanna river; it was operated by the Glenwood coal company, now in bankruptcy. George Filer is general mine superintendent, John Micklow is mining boss and Josiah Carryl is outside foreman.

Description.—The opening to the coal consists of two tunnels, namely, Nos. 1 and 2; No. 1 is located close to the breaker and on the north side of Spring Brook creek, and No. 2 is located one-half of a mile south-east of breaker and on the south side of Spring Brook creek; they mine and prepare 300 tons of coal per day when working; they employ 45 miners, 40 laborers, 8 drivers, 3 door-boys and 5 company men in the mines; 30 slate pickers, 6 head and plate men, 3 drivers, 5 company men, 4 mechanics and 2 bosses outside; in all 151 men and boys; they are working the Spring Brook vein of coal; average thickness six feet. They work headings and air-ways 15 and chambers 25 feet wide; they leave pil-

lars from 10 to 15 feet wide to sustain the roof, and cross-entrances 60 feet apart for the purpose of ventilation; the roof is good rock; the mines are in a good working condition.

Ventilation is produced by furnaces; the intake is located at the mouth of the tunnels; area 75 feet; the outcasts are located in furnace air shafts; area 60 feet; the main doors are hung so as to close of their own accord; they have attendants at main doors; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use one breaker engine of 35-horse power and two hoisting engines on the planes outside of 45-horse power each; the boilers have been cleaned and examined and reported in good condition; they have a steam-gauge to indicate the pressure of steam; the breaker machinery is boxed and fenced off so that operatives are safe; they require no machinery around the tunnels.

Remarks.—They have furnished a map of the mines; the furnace air shaft can be used as a second opening; they have a house for men to wash and change in; the mining boss seems to be a practical and competent man; there are no boys working in the mines under twelve years of age; the engineers seem to be experienced, competent and sober men; the parties having charge know their duty in case of death or serious accident.

Oak Hill Colliery.

This colliery is located in Lackawanna township, and situated on the east bank of the Lackawanna river, on the Lehigh and Susquehanna division of the Central railroad of New Jersey; it is operated by the Glenwood coal company. Geo. Filer is general mine superintendent, Timothy Parfery is mining boss and David Stearns is outside foreman.

Description.—The opening to the coal consists of three tunnels, namely, Nos. 1, 2 and 3; there is a breaker connected with these mines; they mine and prepare 200 tons of coal per day; they employ 30 miners, 25 laborers, 6 drivers, 4 door-boys and 4 company men in the mines; 25 slate pickers, 4 head and plate men, 4 drivers, 3 company men, 4 mechanics and 2 bosses outside; in all 111 men and boys; they are working the old vein; average thickness six feet; they work headings and air-ways 15 and chambers 25 feet wide; they leave pillars from 10 to 12 feet wide to sustain the roof, and cross-entrances sixty feet apart for the purpose of ventilation; the roof is good rock; the mines are in a good working condition.

Ventilation is produced by means of furnaces; the intake is located at mouth of tunnels, area from 50 to 60 feet; the outcast is located in furnace air shaft, area 75 feet; the amount of pure air is 13,200 cubic feet per minute; the main doors are hung so as to close of their own accord; they have attendants at the main doors; the air is circulated to the face of the workings in one volume in each tunnel; the amount of ventilation has been measured and reported. ventilation is good.

Machinery.—They use one steam engine at the breaker of 25-horse power; the boilers have been cleaned and examined and reported in good condition; they have a steam-gauge to indicate the pressure of steam; the breaker machinery is boxed and fenced off so that operatives are safe; they require no machinery around the tunnels.

Remarks.—They have furnished a map of the mines; they have a second opening; they have a house for men to wash and change in; there is some standing water in the mine; the mining boss seems to be a practical and competent man; there are no boys working in the mine under twelve years of age; the engineer seems to be an experienced, competent and sober man; the parties having charge know their duty in case of death or serious accident.

Carbon Hill Colliery.

This colliery is located in Old Forge township, and situated on the west bank of the Lackawanna river, on the Lackawanna and Bloomsburg railroad; it was operated by the Glenwood coal company, now in bankruptcy. George Filer is

general mine superintendent, Edward Jones is mining boss and A. Wisenflew is outside foreman.

Description.—The opening to the coal consists of 2 shafts and a tunnel; one of the shafts caved in about 2 years ago, and is now used as a pump shaft; there is a breaker connected with these mines; they mine and prepare about 250 tons of coal per day: they employ 40 miners, 40 laborers, 5 drivers, 3 door-boys and 5 company men in the mines; 25 slate pickers, 4 head and plate men, 3 drivers, 2 company men, 3 mechanics and 2 bosses outside—in all 132 men and boys. They are working the Carbon Hill vein of coal; average thickness, 6 feet; they work headings 15, air-ways 15 and chambers from 25 to 27 feet wide; they leave pillars from 8 to 15 feet wide to sustain the roof; they leave cross-entrances 60 feet apart for the purpose of ventilation; the roof is rock; the mines are in a good working condition.

Ventilation in the shaft is produced by a steam jet, and in the tunnel by a furnace; the intake for the shaft is in main shaft, area 100, and the upcast is in main shaft, area 60 feet; the intake for tunnel is at mouth of tunnel, area, 50 feet, and the outcast is in furnace air shaft, area 60 feet; there is some noxious gas evolved in the shaft; the mines are examined every morning before men go to work, and every evening to see that the main doors are closed; the main doors are hung to close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings in the shaft in one volume; the amount of pure air in the shaft is 4,000, and in the tunnel 5,000 cubic feet per minute; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use one breaker engine, 25-horse power; 2 hoisting engines, 45-horse power each, and 1 pumping engine, 60-horse power; they have a safety carriage, with all the modern improvements; they have an adequate brake, and flanges of sufficient strength and dimensions for safety attached to the hoisting drum; the boilers have been cleaned and examined and reported in good condition; they have a steam gauge to indicate the pressure of steam; the breaker machinery is boxed and fenced off so that operatives are safe.

Remarks.—They have furnished maps of mines; they have no second opening for the shaft yet, but they have for the tunnel; they have a house for men to wash and change in; there is some standing water in the old shaft workings; the mining boss seems to be a practical and competent man; he has a fire-boss to assist him; there are no boys working in the mines under 12 years of age; the engineers seem to be experienced, competent and sober men; they do not allow any persons to ride on loaded carriages in the shaft; they do not allow over 10 persons to ride on the safety carriage at one time; the parties having charge know their duty in case of death or serious accident; the tunnel workings is a different vein of coal from the vein that they are working in the shaft; the shaft landings are protected by safety gates.

Elliott, Keorner & Co.'s New Colliery.

This colliery is located in Old Forge township, and situated one mile and a half north-west of the Lackawanna river; the opening to the coal consists of a shaft and slope; the shaft is 85 feet deep to the first workable vein; the opening is 10 feet by 45 feet; the slope is located 1,500 feet south-west of the shaft in progress of sinking; they employ 48 men and boys in and around the works.

Pyne Colliery.

This colliery is located in Lackawanna township, and situated about 2 miles north-west of the Lackawanna river; this is a new colliery, owned by the Delaware, Lackawanna and Western railroad company; the opening consists of a shaft and slope; they are also building a new breaker; in the slope they employ 12 sinkers and 4 mechanics. S. D. Kingsley, Esq., has charge of building all the new breakers and keeping them in repairs for this company; he employs about 16 carpenters; John M'Andrews has about 15 masons, and the company has about 12 company men; in all 59 men.

Taylor Colliery Shaft.

This colliery is located in Lackawanna township, and lying about one-fourth of a mile north west of the Lackawanna river; it is 180 feet deep to the Clarke vein; the size of the opening is 10 feet by 19 feet; it is operated by the Delaware, Lackawanna and Western railroad company. Wm. R. Storrs is general coal agent, Benjamin Hughes general mine superintendent, Thos. D. Davis assistant general mine superintendent and E. R. Walter is general superintendent of collieries outside. The above named gentlemen have charge of all the collieries operated by the Delaware, Lackawanna and Western railroad company. John S. Powell is mining boss and J. P. Cooper is outside foreman.

Description.—There is a double breaker connected with this mine, attached to the shaft tower. The coal mined in the shaft and drift of this colliery is prepared here; they mine 490 tons and they prepare 600 tons of coal per day; they employ 59 miners, 50 laborers, 28 drivers, 5 door-boys and 18 company men in the mine; 74 slate pickers, 9 head and plate men, 5 drivers, 21 company men, 10 mechanics and 2 bosses outside; in all 281 men and boys. They are working the Clarke vein of coal; average thickness 9 feet; they work headings 12, air-ways 18 and chambers 30 feet wide; they leave pillars from 5 to 7 yards wide to sustain the roof; they leave cross-entrances from 40 to 50 feet apart for the purpose of ventilation; the roof is slate; the mine is in a good working condition.

Ventilation.—Ventilation is produced by means of a fan located close to the main shaft; the intake is located in the second opening; it contains an area of fifty-two feet; the upcast is located in main shaft; it contains an area of 100 feet; the amount of pure fresh air is 50,960 cubic feet per minute; there is no noxious and inflammable gas evolved in this mine; the mine is examined every morning before the men go to work and every evening to see that the main doors are all closed; the main doors on headings and airways are hung so that they will close of their own accord; they have attendants at main doors; they have double doors on main traveled roads and an extra one in case an accident should happen to any of the others; the air is circulated to the face of the workings systematically by the aid of check doors, &c.; the amount of ventilation has been measured and reported according to law; ventilation is good.

Machinery.—The engines in use at this colliery are one pair of hoisting engines of 120-horse power; one fan engine of 80-horse power, one pumping engine of 110 horse power, one breaker engine of 60-horse power, all in shaft and pumping engine rooms, two steam pumps, one 20 and the other 12-horse power, in fire engine and boiler rooms, and one steam-pump at foot of small shaft, which is located twenty-feet north of main shaft, of 100-horse power; they have a metal speaking tube in the shaft; they have two safety-carriages with all the modern improvements on it: they have flanges of sufficient strength and dimensions for safety and an adequate brake on the hoisting drums; they use standard wire ropes with clevis and cone attachment; the boilers have been cleaned and examined and reported in good condition according to law; they use a steam-gauge and safety-valves for safety and to indicate the pressure of steam: the breaker machinery is boxed and fenced off so that operatives are safe; the shaft-landings are protected by safety-gates.

Remarks.—They have furnished a map of the mine; the second opening is a traveling way driven to the surface, and it is in a good safe condition; they have a house for men to wash and change their clothes in; the mining boss is a competent and practical man; he has a fire-boss to assist him; there are no boys working in the mine under twelve years of age; the engineers seem to be experienced, competent and sober men; there are no persons allowed to ride on carriages in the shaft; the mine rules compel persons to walk in and out the second opening; the parties having charge know their duty in case of death or serious accident; all the mines operated by the Delaware, Lackawanna and Western railroad company compare favorably with any others in this country for uniformity and system; they established a code of mine regulations which are executed and they prevent a great many deaths and accidents; the ventilation of their mines and their mode of conducting the air currents to the face of the workings are systematical.

Taylor Colliery Drift.

This drift is located in Lackawanna township and lying about one-fourth of a mile north-west of the Lackawanna river; it is about 1,800 feet to the face of the drift; size 7½ feet by 7 feet. John S. Powell is mining boss, and J. P. Cooper is outside foreman.

Description.—The coal mined at this drift is prepared at the breaker; they mine about 110 tons of coal per day; they employ 11 miners, 11 laborers, 5 drivers, 2 door-boys and 4 company men in the mine; in all 33 men and boys; they are working the "F" vein of coal; average thickness 7 feet; they work headings 12, airways 15 and chambers 20 feet wide; they leave pillars from 5 to 6 yards to sustain the roof; they leave cross-entrances 60 feet apart for the purpose of ventilation; the roof is good slate; the mine is in a good working condition.

Ventilation.—Ventilation is produced by means of a furnace; it is located about 1,500 feet west of the mouth of the drift; the intake is located at the mouth of the drift; size about 52½ feet; the upcast is in Furnace shaft; area 144 feet; the amount of fresh air per minute is 16,240 cubic feet; there is very little inflammable gas evolved in the mine; the main doors are hung so that they will close of their own accord; they have attendants at the main doors; they have double doors on main traveled roads and an extra one in case an accident should happen to any of the others; the air is circulated to the face of the workings in one volume; the amount of ventilation has been measured and reported; ventilation is good.

Remarks.—There is no machinery required in the workings; they have furnished a map of the mines; they have a second opening; they have a house for men to wash and change their clothes in; the mining boss is a practical and competent man; there are no boys working in the mines under twelve years of age; the parties having charge know their duty in case of death or serious accident.

Coray Breaker Colliery.

This breaker is located in Lackawanna township, and situated about one-fourth of a mile south-east of the Lackawanna river; it is operated by the Lackawanna and Susquehanna coal and iron company; Thomas B Williams is general superintendent, William Reese is mining boss and William H. Daily is outside foreman.

Description.—The opening to the coal consists of two tunnels, namely, Nos. 4 and 5; they are located one mile east of the breaker; they mine and prepare from 300 to 400 tons of coal per day; they employ at No. 4 tunnel 20 miners, 8 laborers, 9 drivers, 5 door-boys and 3 company men, and at No. 5 tunnel 29 miners, 20 laborers, 15 drivers, 6 door-boys and 6 company men in the mines; 34 slate pickers, 11 head and plate men, 6 drivers, 16 company men, 8 mechanics and 2 bosses outside; in all 198 men and boys; they are working the —— vein; average thickness, 6 feet; they work headings 15, air-ways 15 and chambers 30 feet wide; they leave pillars about 12 feet wide to sustain the roof; they leave cross-entrances about 60 feet apart for the purpose of ventilation; the roof is good; the mines are in a good working condition.

Ventilation is produced by furnaces; the intakes are located at mouth of tunnels, areas from 50 to 60 feet; the outcasts are located in furnace air-shaft, areas from 50 to 60 feet; the amount of pure air is 16,000 cubic feet per minute; the main doors are hung so as to close of their own accord; they have attendants at main doors; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use 1 breaker engine, 60-horse power; the boilers have been cleaned and examined and reported in good condition; they have a steam gauge to indicate the pressure of steam; the breaker machinery is boxed and fenced off so that operatives are safe; there is no machinery required at the tunnels.

Remarks.—They have furnished a map of mines; they have a second opening; they have no house for men to wash or change in; the mining boss seems to be a practical and competent man; there are no boys working in the mines under 12 years of age; the engineer seems to be a practical and sober man; the parties having charge know their duty in case of death or serious accident; they use 2 locomotives to run coal from the mines to the breaker; the engines will average about 20-horse power each.

Greenwood Breaker Colliery.

This breaker is located in Lackawanna township, and situated ½ mile southeast of the Lackawanna river; it is operated by the L. S. C. & I. Co. Thomas B. Williams is general superintendent, William Eynow is mining boss and M. L. Covne is Outside foreman.

Description.—The coal that is prepared at this breaker is mined at No. 6 tunnel, which is situated about ½ mile south; they mine and prepare from 200 to 300 tons of coal per day; they employ 37 miners, 31 laborers, 19 drivers, 7 door-boys and 7 company men in the mine; 38 slate pickers, 5 head and plate men, 7 drivers, 6 company men, 5 mechanics and 2 bosses outside; in all 164 men and boys; they are working the "Old" vein; average thickness 6½ feet; they work headings 15, air-ways 15 and chambers 27 feet wide; they leave pillars from 8 to 14 feet wide to sustain the roof; they leave cross-entrances 60 feet apart for the purpose of ventilation; the roof is good; the mine is in a good working condition.

Ventilation is produced by a furnace; the in-take is located at mouth of tunnel, area 50 feet; the out-cast is located in furnace air-shaft, area 50 feet; the main doors are hung so as to close of their own accord; they have attendants at main doors; the amount of ventilation has been measured and reported; ventilation is good.

Machinery—They use 1 steam engine at the breaker of 40-horse power; the breaker machinery is boxed and fenced off so that operatives are safe; they use no machinery at the tunnel.

Remarks.—They have furnished a map of mine; they have a second opening; they have no house for men to wash or change in; the mining boss seems to be a practical and competent man; there are no boys working in the mine under 12 years of age; the engineers seem to be experienced, competent and sober men; the parties having charge know their duty in case of death or serious accident.

Stafford Brook Colliery.

This colliery is located in Lackawanna township and situated 500 feet southeast of the Lackawanna river. It is operated by the W. V. R. R. and coal company. William Connell is general superintendent, James Connell is mining boss and W. Thomas is outside foreman.

Description.—The opening to the coal consists of a shaft and two tunnels; the shaft is 70 feet deep to No. 2 vein, which is the bottom bench of the Big vein; there is a breaker connected with these mines; they mine and prepare about 200 tons of coal per day; they employ 41 miners, 10 laborers, 24 drivers, 4 door-boys and 19 company men in the mines; 20 slate pickers, 4 head and plate men, 4 drivers, 11 company men, 4 mechanics and 2 bosses outside; in all 143 men and boys; they are working the No. 2 vein of coal; average thickness about 8 feet; they work headings and air-ways from 12 to 15 and chambers 25 feet wide; they leave pillars about 15 feet wide to sustain the roof; they leave cross-entrances about 60 feet apart for the purpose of ventilation; the roof is rock; the mines are in a good working condition.

Ventilation is produced by furnaces; the intakes are located at mouths of tunnels; area about 96 feet; the outcasts are located in furnace air shaft; area about 96 feet; the amount of pure air is 28,200 cubic feet per minute; the main doors are hung so that they will close of their own accord; they have attendants at main doors; they have double doors on main traveled roads and an extra one in case of an accident to any of the others; the air is circulated to the face of the workings in two splits; the amount of ventilation has been measured and reported: ventilation is good.

Machinery.—They use one breaker engine of 25-horse power and one hoisting engine of 40-horse power; the boilers have been cleaned and examined and reported in good condition; they have a steam-gauge to indicate the pressure of steam; the breaker machinery is boxed and fenced off so that operatives are safe; there is no machinery required at the tunnels.

Remarks.—They have furnished a map of the mines; they have second openings; they have a house for men to wash and change in; the mining boss seems to be a practical and competent man; he has a fire-boss to assist him; there are no boys working in the mines under twelve years of age; the engineers seem to

be experienced, competent and sober men; the parties having charge know their duty in case of death or serious accident; the shaft landing is protected by a vertical safety-gate.

National Anthracite Colliery.

This colliery is located in the city of Scranton, and located about 1,000 feet south-east of the Lackawanna river. It is operated by the W. V. R. R. and C. Co. Wm. Connell is general superintendent, John Humphrey is mining boss and Robert Penman is outside foreman.

Description.—The opening to the coal consists of four tunnels; there is a breaker connected with these mines; they mine and prepare about 300 tons of coal per day; they employ 73 miners 40 laborers, 30 drivers, 5 door-boys and 18 company men in the mines; 45 slate pickers, 6 head and plate men, 5 drivers, 20 company men, 4 mechanics and 2 bosses outside; in all 248 men and boys; they are working the No. 2 and 3 veins; No. 3 vein is commonly called and known as the Clarke vein; average thickness of No. 2 is 8 and No. 3 vein is 9 feet; they work headings and air-ways, from 12 to 15 and chambers 25 feet wide; they leave pillars 15 feet wide to sustain the roof; they leave cross-entrances 60 feet apart for the purpose of ventilation; the roof is rock; the mines are in a good working condition.

Ventilation is produced by furnaces; the in-takes are located at mouth of tunnels, area about 96 feet; the out-casts are located in furnace air-shaft, area about 96 feet; the amount of pure air is 21,800 cubic feet per minute; the main doors are hung so as to close of their own accord; they have attendants at main doors; they have double doors on main traveled roads, and an extra one in case of an accident to any of the others; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use 1 breaker engine of 25-horse power, and 2 hoisting engines, each 30-horse power; there is no machinery required at the tunnels.

Remarks.—They have furnished a map of mines; they have a second opening for each tunnel; they have a house for men to wash and change in; the mining boss seems to be a practical and competent man; he has a fire boss to assist him; there are no boys working in the mine under 12 years of age; the engineers seem to be experienced, competent and sober men; the parties having charge know their duty in case of death or serious accident; the breaker machinery is boxed and fenced off so that operatives are safe.

Meadow Brook Colliery.

This colliery is located in the city of Scranton, and situated about 1,000 feet east of the Lackawanna river; it is operated by William Connell & Co.; Thomas L. Jones is mining boss, and William Humphrey is outside foreman.

Description.—The openings consist of 4 tunnels, namely, Nos. 1, 3, 4 and 6; there is a double breaker connected with these mines; they mine and prepare about 480 tons of coal per day; they employ 70 miners, 74 laborers, 20 drivers, 8 door-boys and 13 company men in the mines; 60 slate pickers, 8 head and plate men, 2 drivers, 17 company men, 6 mechanics and 3 bosses outside—in all 281 men and boys; they are working No. 5 vein in Nos. 1, 3 and 6 tunnels, and No. 3 vein in No. 4 tunnel; they work headings and air-ways from 12 to 15, and chambers about 25 feet wide; they leave pillars about 15 feet wide to sustain the roof; they leave cross-entrances about 60 feet apart for the purpose of ventilation; the roof is hard rock; the mines are in a good working condition.

Ventilation is produced by means of furnaces; the intakes are located at mouth of tunnel, areas from 72 to 90 feet; the upcasts are located in furnace air shafts, areas from 72 to 90 feet; the amount of pure fresh air is 64,800 cubic feet per minute; the main doors are hung so that they will close of their own accord; they have attendants at main doors; they have double doors on main travelled roads, and an extra one in case any of the others get broken; the amount of ventilation has been measured and reported according to law; ventilation is good.

Machinery.—They use no machinery at the tunnels, but at the breaker they use one breaker engine, 45-horse power, and 2 locomotives, 20-horse power each, to haul coal from the drifts to the breaker to get prepared; the boilers have been cleaned and examined and reported in good condition; they have a steam gauge to indicate the pressure of steam.

Remarks —They have furnished a map of mines; they have second openings for each tunnel; they have a house for men to wash and change in; the mining boss seems to be a practical and competent man; he has persons to assist him; there are no boys working in the mines under 12 years of age; the engineers seem to be experienced, competent and sober men; the parties having charge know their duty in case of death or serious accident; the breaker machinery is fenced and boxed off so that operatives are safe. They use one locomotive of 20-horse power to run coal from the mines to the breaker.

Local Coal Sale Mines in the 12th Ward of the City of Scranton.

One of these mines is operated by Gardner, Clark & Co.; the opening to the coal consists of a tunnel and a "slope which they are just sinking;" there is a small breaker connected with these mines which has a capacity of cleaning and preparing 80 tons of coal per day. The other is operated by John Gibson & Co.; they work at these two mines 40 men and boys; this vein is called the Rolling Mill vein; average thickness, 5 feet; the roof is good hard rock; the mines are not systematically worked.

Scranton Coal Company's Mine.

This mine is located in Lackawanna township and situated on the west bank of the Lackawanna river; the slope is 550 feet long to the first lift, then a level of 270 feet, and then 450 feet long to the bottom; it is 7 feet high by 16 feet wide; it is operated by the Delaware, Lackawanna and Western railroad company. Richard M. Hackett is mining boss and John A. Mears is outside foreman.

Description.—There is a breaker connected with this mine 600 feet away; they mine and prepare about 450 tons of coal per day; they employ 59 miners, 59 laborers, 29 drivers, 8 door-boys and 22 company men in the mine; 56 slate pickers, 10 head and plate men, 5 drivers, 20 company men, 6 mechanics and 2 bosses outside; in all 276 men and boys; they are working the "G" or Big vein; average thickness 13 feet; they work headings 12, airways 18 and chambers about 30 feet wide; they leave pillars from 15 to 21 feet wide to sustain the roof; they leave cross-entrances about 60 feet apart for the purpose of ventilation; the roof is good slate; the mine is in good working condition.

Ventilation is produced by means of a furnace located 1,500 feet from the main opening; the intake is located at mouth of drift north of breaker, area 42 feet; the outcast is located in Furnace air shaft, area 36 feet; the amount of fresh air is 24,000 cubic feet per minute; there is noxious, poisonous and inflammable gas evolved in the mine; the mine is examined every morning before men go to work and every evening to see that the main doors are all closed; the main doors are hung so that they will close of their own accord; they have attendants at main doors; they have double doors on main traveled roads and an extra one in case of an accident to any of the others; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use one hoisting engine of 80-horse power, one hoisting engine inside of 60-horse power, two steam pumps of 25 and 18-horse power each; one breaker engine of 95-horse power in breaker engine room; they have a metal speaking tube in the mines; they have an adequate brake and flanges of sufficient strength for safety attached to their hoisting drum; the boilers have been cleansed and examined and reported in good condition; they have a steam-gauge to indicate the pressure of steam.

Remarks.—They have furnished a map of the mine; they have a second opening 700 feet from main opening; they have no house for men to wash or change in; the mining boss seems to be a practical and competent man; there are no

boys working in the mine under twelve years of age; the engineers seem to be experienced, competent and sober men; the parties having charge know their duty in case of death or serious accident.

Dodge Colliery.

This colliery is located in Lackawanna township, about ½ of a mile north-west of the Lackawanna river. The shaft opening is 211 feet to the Rock, and 301 feet deep to the 14 feet vein; it is 10 feet by 24 feet. It is operated by the Delaware, Lackawanna and Western railroad company. Lewis Roberts is mining boss and Edward E. Thomas is outside foreman.

Description.—There is a double breaker connected with these mines; it is located on the Lackawanna and Bloomsburg railroad, 1,100 feet east of shaft; they mine and prepare 630 tons of coal per day; they employ 67 miners, 66 laborers, 32 drivers, 8 door-boys and 12 company men in the mines; 76 slate pickers, 11 head and plate men, 7 drivers, 16 company men, 8 mechanics and 2 bosses outside; in all 305 men and boys; they are working a plane in the mines from the Rock to the 14-feet vein; it is 325 feet long and driven on an angle of 18 degrees; they are working the G and F veins; average thickness of the G vein 12 and F vein 7 feet; they work headings 12, air-ways 15 and chambers 30 feet wide; they leave pillars from 18 to 24 feet wide to sustain the roof; they leave cross-entrances about 60 feet apart for the purpose of ventilation; the roof in the G is slate and in the F vein rock; the mines are in a good working condition.

Ventilation is produced by means of a double furnace, located 1,000 feet from main opening; the in-take is located in main shaft and in second opening; it contains an area of 138 feet; the up-cast is located in furnace air-shaft; it contains an area of 120 feet; there is noxious, poisonous and inflammable gas evolved in this mine; the mines are examined every morning before men are allowed to go to work, and every evening to see that the main doors are all closed; the main doors on headings and air-ways are hung so that they close of their own accord; they have attendants at main doors; they have double doors on main traveled roads, and an extra one in case of an accident to any of the others; the air is circulated to the face of the workings in 4 splits; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use 1 pair of hoisting engines of 90-horse power, 1 pumping engine of 95-horse power—all in engine room at the shaft—and 1 breaker engine of 60-horse power in the breaker engine house; they have 2 metal speaking-tubes in the shaft; they have 2 safety-carriages with all the modern improvements; they have an adequate brake and flanges of sufficient strength and dimensions attached to the sides of their hoisting drums; they use standard wire ropes with clevis and cone attachments; the boilers have been cleaned and examined and reported in good condition; they have a steam gauge to indicate the pressure of steam; the breaker machinery is boxed and fenced off so that operatives are safe.

Remarks.—They have furnished a map of the mines; they are connected with Bellevue slope which can be used as a second opening; they have no house for men to wash or change their clothes in; there is some standing water in the mine; the mining boss seems to be an experienced, competent and practical man; he has a fire-boss to assist him; there are no boys working in the mines under 12 years of age; the engineers seem to be experienced, competent and sober men; they do not allow any person to ride on loaded carriages in the shaft or on loaded cars in the slope; they do not allow more than 10 men to ride on the safety carriage at one time; the parties having charge know their duty in case of death or serious accident; the shaft-landings are protected by safety-gates.

Note.—Thomas Sayer, Esq., has charge of the boilers and machinery for the Delaware, Lackawanna and Western railroad company. He is a gentleman of practical experience and he keeps the boilers cleaned and examined and the machinery in good condition, so as to comply with the requirements of law.

Bellevue Shaft Colliery.

This colliery is located in Lackawanna township, and lying one-fourth of a mile north-west of the Lackawanna river; the shaft is 182 feet deep to the G vein. The opening is 10 feet by 18 feet; it is operated by the Delaware, Lackawanna and Western railroad company; John Hale is mining boss, and J. M. Acker is outside foreman.

Description.—There is a double breaker attached to the shaft tower; they mine and prepare about 350 tons of coal per day; they employ 42 miners, 42 laborers, 22 drivers, 12 door-boys and 15 company men in the mine; 51 slate pickers, 7 head and plate men, 4 drivers, 17 company men, 5 mechanics and 2 bosses outside; in all 219 men and boys; they are working the G or Big vein, average thickness 12 feet; they work headings 12, air-ways 15 and chambers 30 feet wide: they leave pillars from 15 to 20 feet wide to sustain the roof; they leave cross entrances about 60 feet apart for the purpose of ventilation; the roof is good slate; the mine is in a good working condition.

Ventilation is produced by means of a furnace located 500 feet from main opening; the intake is located at mouth of shaft, area 180 feet; the upcast is located in furnace air shaft, area 36 feet; the amount of fresh air per minute is 18,060 cubic feet; there is poisonous, noxious and inflammable gas evolved in this mine; the mine is examined every morning before men go to work, and every evening to see that the main doors are all closed; the main doors are hung so as they will close of their own accord; they have attendants at main doors; they have double doors on traveled roads and an extra one in case that any of the others would get broken; the air is circulated to the face of the workings in two splits; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use one pair of hoisting engines of 90-horse power, one pumping engine of 80-horse power, one breaker engine of 40-horse power, all in shaft engine rooms; one fire pump of 30-horse power in donkey house at river; they have a metal speaking tube in the shaft; they have two safety carriages with all the modern improvements; they have an adequate brake and flanges of sufficient strength and dimensions attached to their hoisting drums; they use standard wire ropes, with clevis and cone attachments; the boilers have been cleaned and examined and reported in good condition; they have a steam guage to indicate the pressure of steam.

Remarks.—They have furnished a map of mine; they are connected with Dodge shaft workings, which can be used as a second opening; they have a house for men to wash and change their clothes in; there is some standing water in the mines; the mining boss is a practical and competent man; he has a fire boss to assist him; there are no boys working in the mine under twelve years of age; the engineers seem to be experienced, competent and sober men; they do not allow any persons to ride on loaded carriages in the shaft; they do not allow more than ten persons to ride on the safety carriage at one time; the parties having charge know their duty in case of death or serious accident; the shaft landings are protected by safety gates.

Bellevue Slope Colliery.

This colliery is located in Lackawanna township, and lying one-fourth of a mile north-west of the Lackawanna river; the slope is 300 feet long to the Diamond, and 710 feet long to the Rock vein; it is 7 feet high by 14 feet wide; it is driven on an angle of 11°; it is operated by the Delaware, Lackawanna and Western railroad company; John Hale is mining boss, J. M. Acker is outside foreman.

Description.—There is a breaker connected with this mine, located 600 feet away; they mine and prepare 350 tons of coal per day; they employ 36 miners, 36 laborers, 10 drivers, 10 door-boys and 9 company men in the mines; 51 slate pickers, 6 head and plate men, 5 drivers and 14 company men outside; they have the same mechanics and bosses that they have at the shaft workings—in all 177 men and boys; they are working the Diamond and Rock veins; average thickness, 7 feet each; they work headings 12, air-ways 15 and chambers 30 feet wide; they leave pillars from 15 to 20 feet wide to sustain the roof; they leave cross entrances about 60 feet apart for the purpose of ventilation; the roof is slate; the mines are in a good working condition.

Ventilation is produced by means of a furnace, located 400 feet from main opening; the intake is located at mouth of slope, area 98 feet; the upcast is located at furnace air shaft, area 25 feet; the amount of fresh air is 16,100 cubic feet per minute; there is noxious gas evolved in the F vein; the mines are examined every morning before men go to work, and every evening to see that the main doors are all closed; the main doors are hung so as they will close of their own accord; they have attendants at main doors; they have double doors on main traveled roads, and an extra one in case that an accident would happen to any of the others; the air is circulated to the face of the workings in two splits; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use one pair of hoisting engines of 120-horse power, one breaker engine of 40-horse power, one pumping engine of 80-horse power, one steam pump in the slope of 20-horse power; they have a metal speaking tube in slope; they have an adequate brake and flanges of sufficient strength and dimensions attached to the sides of the hoisting drum; the boilers have been cleaned and examined and reported in good condition; they have a steam guage to indicate the pressure of steam; also a safety valve for safety.

Remarks.—They have furnished a map of the mines; they are connected with Dodge shaft and the old slope, which can be used as second opening; they have a house for men to wash and change in; there is some standing water in the mines; the mining boss is a practical and competent man; he has a fire boss to assist him; there are no boys working in the mines under twelve years of age; the engineers seem to be experienced, competent and sober men; they do not allow any persons to ride on loaded cars in the slope; the parties having charge know their duty in case of death or serious accident; the breaker machinery is boxed and fenced off so that operatives are safe.

Oxford Shaft.

This shaft is located in Scranton city, about ¼ of a mile north-west of the Lackawanna river. It is 206 feet deep to the Diamond vein and 238 feet deep to the Rock vein; the opening is 22 feet by 10 feet. It is operated by the Delaware, Lackawanna and Western railroad company. John Lewis is mining boss and William H. Carling is outside foreman.

Description.—There is a double breaker attached to the shaft tower, which has 2 self-dumping hoisting carriages for the purpose of hoisting coal out of the mines; they mine and prepare about 550 tons of coal per day; they employ 57 miners, 40 laborers, 31 drivers, 11 door-boys and 19 company men in the mines; 56 slate pickers, 7 head and plate men, 5 drivers, 20 company men, 7 mechanics and 2 bosses outside; in all 255 men and boys; they have a second opening from the surface to both veins, where men and mules travel into and out of the mines they are working the Diamond and Rock veins at this colliery, average thickness of Diamond vein is 6 feet and Rock vein 8 feet; they work their headings 12, airways 12 and chambers 30 feet wide; they leave pillars from 6 to 7 yards wide to sustain the roof; they leave cross-entrances from 20 to 30 yards apart for the purpose of ventilation; the roof is good slate; the mines are in a good working condition; the mouth of second opening is on the west bank of the Lackawanna river.

Ventilation.—Ventilation is produced by a large arched brick furnace; the intake is located at the mouth of second opening, the area is 60 square feet; the up-cast is located in air-shaft at the furnace, 900 feet from main shaft; it contains an area of 60 feet; the air is conducted to the face of the workings in both veins systematically by the aid of check-doors; the average supply of pure, fresh air at in-take is 18,000 cubic feet per minute; there is but very little noxious or inflammable gas evolved in this mine; it is never found in the mines except when a door or gate is broken and then not to any dangerous extent; the main doors are all hung so that they will close of their own accord, with an attendant at each; they have double doors on main traveled roads so as to keep up a steady current of air, and they have extra doors in case that any of the others get broken; they do not work over fifty men in any split of air; the amount of ventilation has been measured and reported according to law; ventilation is good.

Machinery.—The engines in use at these mines are 1 pair of hoisting engines of 90-horse power, 1 breaker engine of 60-horse power, 1 pumping engine of 80-

horse power, all in engine room, and 1 hoisting engine inside of 25-horse power; they have a metal speaking-tube in the shaft; they use clevis cones and standard wire ropes; the flanges on the sides of hoisting drums are of sufficient strength and dimensions for safety; they have a good steam brake on hoisting drum; the boilers have been cleaned and examined and reported in good condition according to law; they have a safety-valve and steam gauge attached to their boilers, for the purpose of safety and to indicate the pressure of steam; the breaker machinery, screens, shaftings, cog-wheels, beltings and pulleys are boxed and fenced off so that operatives are safe.

Remarks.—The company have furnished a map of the mines; they have a house for men to wash and change their clothes in; they have some standing water in the mines but they are not working towards it; the mining boss is a practical and competent man; he has no fire boss or assistant; there are no boys allowed to work in the mines under 12 years of age; the engineers seem to be experienced, competent and sober men; there are no persons allowed to ride on loaded cars on planes around the mines; the parties having charge know their duty in case of death or serious accident; persons are prohibited by the mine regulations from riding up or down the shaft; the shaft-landings are protected by safety-gates.

Central Colliery.

This colliery is located in the city of Scranton, and lying about one mile northwest of the Lackawanna river. It is 176 feet deep to the Diamond vein, 202 feet deep to the Rock vein, and 320 feet deep to the G or Big vein. The opening is 34 feet by 10 feet. It is operated by the Delaware, Lackawanna and Western railroad company. John Flynn is mining boss, and S. N. Stetler is outside foreman.

Description.—There is a double breaker attached to the shaft tower; they mine and prepare about 450 tons of coal per day; they employ 56 miners, 58 laborers, 26 drivers, 3 door-boys and 22 company men in the mine; 57 slate pickers, 8 head and plate men, 3 drivers, 15 company men, 7 mechanics and 2 bosses outside; in all 257 men and boys; they are working the G or Big vein; average thickness 12 feet; they work headings 12, air-ways 18 and chambers 30 feet wide; they leave pillars to sustain the roof, 21 feet wide; they leave cross entrances 60 feet apart for the purpose of ventilation; the roof is good slate; the mine is in a good working condition.

Ventilation.—Ventilation is produced by means of a fan, located on the surface close to main shaft; the intakes are located in main shaft and Hyde Park air shaft; it contains an area of 160 feet in main shaft; the upcast is located at main shaft; it contains an area of 90 feet; the average supply of fresh air per minute is 36,500 cubic feet; they have inflammable, noxious and poisonous gases evolved in the mine; the mine is examined every morning before the men are allowed to go to work, and every evening to see that the main doors are all closed, so as to keep up a steady current of air; the main doors on headings and air-ways are hung so as they will close of their own accord, and they have attendants at each to keep them closed; they have double doors on main traveled roads, and an extra one in case that one of the others would get broken; they do not work over fifty men in any split of air; the amount of ventilation has been measured and reported according to law; ventilation is good.

Machinery.—The engines in use at this colliery are one pair of hoisting engines of 120-horse power, one fan engine of 60-horse power, and one breaker engine of 80-horse power, all in engine room; one steam pump at foot of shaft of 15-horse power; 2 pumping engines of 150-horse power in shaft engine room; they have a metal speaking tube in the shaft; they have two patent safety carriages with all the modern improvements; they have flanges of sufficient strength and dimensions attached to the sides of the hoisting drums; they have an adequate brake on hoisting drums; they use clevis, cones and standard wire ropes; the boilers have been cleaned and examined and reported in good condition according to law; they have a steam gauge and safety-valve for safety and to indicate the pressure of steam; the breaker machinery is boxed and fenced off so that operatives are safe; all the machinery, boilers, &c., are new and in good condition.

Remarks.—The company have furnished a map of the mine; they are connected with the Hyde Park shaft, which can be used as a second opening; they have a

house for men to wash and change their clothes in; there is no standing gas or water in the mine; the mining boss seems to be a practical and competent man; he has a fire-boss to assist him; there are no boys allowed to work in the mine under 12 years of age; the engineers are said to be competent, practical and sober men; there are no persons allowed to ride on loaded carriages in the shaft; they do not allow more than 10 men to ride on the safety carriage at one time; the persons having charge know their duty in case of death or serious accident; the shaft landings are protected by safety gates.

Sloan Colliery.

This colliery is located in Lackawanna township, and situated 1 mile north-west of the Lackawanna river; the shaft is 250 feet deep to the Diamond, 285 feet deep to the Rock, and 393 feet deep to the G or Big vein; this is the cross-section of strata in the shaft opening; they are also driving a slope for the second opening; it is 500 feet long to the E vein, and 580 feet long to the T vein; they employ 18 company men in the mine, 5 mechanics and 2 bosses outside; in all 25 men; they have a double breaker attached to the shaft tower; they do not intend to mine any coal until they connect between the shaft and slope for a second opening; it will take 3 months before they can connect.

Archbald Colliery.

This colliery is located in Lackawanna township, and lying one and one-fourth miles north-west of the Lackawanna river, in Keiser valley. It is operated by the Delaware, Lackawanna and Western railroad company. John Gooden is mining boss and John Fern is outside foreman. The slope is used as a second opening.

Description.—These mines are opened by a shaft; it is 188 feet to the Diamond, 216 to the Rock and 307 feet deep to the "G" or Big vein; it is 10 feet by 27 feet, and by a slope 500 feet long driven at an angle of 18 degrees; it is — feet wide by — feet high; there is a double breaker attached to the shaft tower; they mine and prepare about 240 tons of coal per day; they employ 28 miners, 28 laborers, 8 drivers, 2 door-boys and 13 company men in the mines; 52 slate pickers, 7 head and plate men, 1 driver, 19 company men, 9 mechanics and 2 bosses outside; in all 169 men and boys; they are working the "G" or Big and Rock veins of coal; average thickness of "G" or Big vein 10 and Rock 6½ feet; they work headings 12, air-ways 15 and chamber 30 feet wide; they leave pillars from 5 to 6 yards wide to sustain the roof; they leave cross-entrances from 50 to 70 feet apart for the purpose of ventilation; the roof is good slate; the mines are in a good working condition.

Ventilation.—Ventilation is produced by means of a fan located near the main opening; the intake is located at mouth of shaft; it contains an area of 160 feet; the upcast is located in air-shaft, it contains an area of 110 feet; the amount of fresh air is 10,200 cubic feet per minute; there is very little noxious or poisonous gas evolved in these mines; the main doors are hung so that they will close of their own accord; they have attendants at main doors; they have double doors on main traveled roads and an extra one in case of an accident to any of the others; the air is circulated to the face of the workings in two splits; the amount of ventilation has been measured and reported according to law; ventilation is good.

Machinery.—They use one pair hoisting engines of 120-horse power, one breaker engine of 80-horse power; in shaft engine room one fan engine of 60-horse power, one steam-pump at foot of shaft of 20-horse power; they have two metal speaking tubes in the shaft; they have two safety-carriages with all the modern improvements; they have an adequate brake and flanges of sufficient strength and dimensions for safety attached to the hoisting drums; they use standard wire ropes with clevis and cone attachment; the boilers have been cleaned and examined and reported in good condition according to law; they have a steam-gauge to indicate the pressure of steam; the breaker machinery is fenced and boxed off so that operatives are safe.

Remarks.—They have furnished a map of the mines; they have a second opening for each vein located about 1,000 feet from main opening; they have a house for men to wash and change their clothes in; they have an opening to the surface where men and mules can travel in and out at all times; there are no boys working in the mines under twelve years of age; the engineers seem to be experienced, competent and sober men; the mining boss seems to be an experienced and competent man; the parties having charge know their duty in case of death or serious accident; the shaft landings are protected by safety-gates.

Continental Colliery.

This colliery is located in Lackawanna township, and lying one and one-fourth miles north-west of the Lackawanna river, in Keiser valley. The shaft is 112 feet to the Diamond or E, 242 feet to the F or Rock, and 292 feet deep to the Clark vein; the opening is 10 feet by 21 feet. It is operated by the Delaware, Lackawanna and Western railroad company. William Dorne is mining boss, and James F. Green is outside foreman.

Description.—There is a double breaker attached to the shaft tower; they mine and prepare 470 tons of coal per day; they employ 67 miners, 67 laborers, 23 drivers, 11 door-boys and 20 company men in the mine; 46 slate pickers, 8 head and plate men, 2 drivers, 20 company men, 10 mechanics and 2 bosses outside; in all 276 men and boys; they have opened from the Clark to the G vein by a rock tunnel 850 feet long; they are working the Clark vein of coal; average thickness 7 feet; they are just opening in the G vein; they work headings 12, air-ways 18 and chambers 30 feet wide; they leave pillars from 5 to 7 yards wide to sustain the roof; they leave cross entrances about 20 yards apart for the purpose of ventilation; the roof is good slate; the mine is in a good working condition.

Ventilation.—The ventilation is produced by means of a fan, which is located north of main shaft; the intake is located at the mouth of shaft; it contains an area of 100 feet; the upcast is at fan air-shaft, area 100 feet; the amount of pure, fresh air is 34,740 cubic feet per minute; there is no noxious or poisonous gas evolved in these mines; the main doors are hung so as they will close of their own accord; they have attendants at main doors; they have double doors on the main traveled roads, and an extra door in case that any of the others should get broken; the air is circulated to the face of the workings in two splits; the amount of ventilation has been measured and reported according to law; ventilation is good.

Machinery.—They use one pair of hoisting engines of 120-horse power, one pumping engine of 95-horse power and one breaker engine of 40-horse power, all in shaft engine room; one steam pump foot of shaft of 80-horse power, and one fan engine in the fan engine house of 60-horse power; they have a metal speaking tube in the mine; they have two safety carriages with all the modern improvements; they have flanges of sufficient strength and dimensions for safety, and an adequate brake on their hoisting drum; they use stranded wire ropes with clevis and cone attachment; the boilers have been cleaned and examined and reported in good condition; they use a safety-valve to indicate the pressure of steam.

Remarks.—They have furnished a map of mine; they have an opening to daylight where men and mules travel in and out; they have no house for men to wash and change their clothes in; the mining boss seems to be a practical and competent man; there are no boys working in the mine under twelve years of age; the engineers seem to be experienced, competent and sober men; the parties having charge know their duty in case of death or serious accident; the shaft landings are protected by safety-gates; the breaker machinery is fenced and boxed off so that operatives are safe.

Hampton Colliery.

This colliery is located in Lackawanna township, and lying one mile north-west of the Lackawanna river; it is 125 feet deep to the Diamond vein; it is 16 feet by 9 feet; it is operated by the Delaware, Lackawanna and Western railroad company. Thomas Carson is mining boss, and Jas. F. Green is outside foreman.

Description.—They have a double breaker attached to the shaft tower; they mine and prepare 550 tons of coal per day; they employ 68 miners, 64 laborers, 33 drivers, 10 door-boys and 18 company men in the mine; 55 slate pickers, 12 head and plate men, 4 drivers, 27 company men, 9 mechanics and 2 bosses outside; in all 302 men and boys; they are working 2 slopes in the mine, which are worked by machinery; one is 420 feet long, and the other 575 feet long, each driven on an angle of 7°; they are working the Diamond vein, average thickness 5½ feet; they work headings 12, air-ways 12 and chambers 30 feet wide; they leave pillars from 5 to 6 yards wide to sustain the roof; they leave cross-entrances 20 yards apart for the purpose of ventilation; the roof is good slate; the mine is in a good working condition.

Ventilation.—The ventilation is produced by means of a furnace located about 1,000 feet from main opening; the intake is located in Central and Sloan shafts; it contains an area of 100 feet; the upcast is located at furnace shaft; it contains an area of 80 feet; the amount of fresh air is 25,225 cubic feet per minute; there is very little noxious or poisonous gas evolved in the mine; the main doors on headings and air-ways are hung so that they will close of their own accord; they have attendants at main doors; they have double doors on main travelled roads, and an extra one in case an accident should happen to any of the others; the air is circulated to the face of the workings in 2 splits; the amount of ventilation has been measured and reported according to law; ventilation is good.

Machinery.—They use 1 pair of hoisting engines, 120-horse power, and 1 pumping, 100-horse power, in hoisting engines' rooms; 1 breaker engine, —— horse power; 2 hoisting engines inside, —— horse power each; 4 steam pumps inside, —— horse power; they have a metal speaking tube in the shaft; they have 2 safety carriages, with all the modern improvements; they have an adequate brake, and flanges of sufficient strength and dimensions for safety attached to the side of the hoisting drum: they use standard wire ropes, with clevis and cone attachment; the boilers have been cleaned and examined and reported in good condition; they have a steam gauge to indicate the pressure of steam.

Remarks.—They have furnished a map of the mine; they are connected with Continental, Sloan and Central shafts, which can be used as second openings; they have no house for men to wash or change their clothes in; they have no standing gas, but some water in their mine; the mining boss is a practical and competent man; there are no boys working in the mine under 12 years of age; the engineers seem to be experienced, competent and sober men; they do not allow any persons to ride on loaded carriages in the shaft or on loaded cars in the slope; they do not allow more than 10 persons to ride on safety carriages in the shaft at one time; the parties having charge know their duty in case of death or serious accident; the shaft landings are protected by safety gates; the breaker machinery is fenced and boxed off so that operatives are safe.

Hyde Park Colliery.

This colliery is located in the city of Scranton, lying about 1¼ miles north-west of the Lackawanna river. It is 148 feet deep to the Diamond, 183½ feet deep to the Rock and 265 feet deep to the G or Big vein; the shaft-opening is 18 feet by 10 feet. It is operated by the Delaware, Lackawanna and Western railroad company. D. W. Moser is mining boss and Robert E. Ruthven is outside foreman.

Description.—There is a double breaker attached to the shaft tower; they have 2 patent safety-carriages with all the modern improvements; they mine and prepare about 450 tons of coal per day; they employ 61 miners, 61 laborers, 23 drivers, 9 door-boys and 14 company men in the mine; 80 slate pickers, 9 head and plate men, 3 drivers, 20 company men, 8 mechanics and 2 bosses outside: in all 290 men and boys; they are working the G or Big vein, average thickness 12 feet; they work headings 12, air-ways 18 and chambers 30 feet wide; they leave pillars from 6 to 7 yards wide to sustain the roof; they leave cross-entrances 60 feet apart for the purpose of ventilation; the roof is good slate; the mine is in a good working condition.

Ventilation.—Ventilation is produced by means of a fan located in Central shaft; the in-take is located in air-shaft about 1,000 feet from main shaft; it contains an area of 120 feet; the up-cast is located in Central shaft, it contains an area of 110 feet; the average supply of fresh air per minute is 30,880 cubic feet;

there is but very little noxious or inflammable gas evolved in this mine; it is very seldom ever seen in the mine except when a door or gate is broken, and then not to any dangerous extent; the main doors are all hung so that they will close of their own accord, with an attendant at each; they have double doors on main traveled roads so as to keep up a steady current of air, and they have extra doors in case that any of the others get broken; they do not work over 50 men in any split of air; the amount of ventilation has been measured and reported according to law; ventilation is good.

Machinery.—The engines in use at this colliery are 1 pair of hoisting engines of 120-horse power, 1 breaker engine of 60-horse power, 1 steam fire pump of 30-horse power, (all the above are in the shaft engine room,) and 1 steam pump at the foot of shaft of 80-horse power; they have a metal speaking-tube in the shaft; the flanges on the sides of the hoisting drums are of sufficient strength and dimensions for safety; they have an adequate brake on hoisting drum; they use clevis cones and standard wire ropes; the boilers have been cleaned and examined and reported in good condition according to law; they have a safety valve and steam gauge attached to their boilers for the purpose of safety and to indicate the pressure of steam; the breaker machinery, screens, shaftings, cog-wheels, beltings and pulleys are boxed and fenced off so that operatives are safe.

Remarks.—They have furnished a map of mine; they have second openings in Central and Continental shafts; they have a house for men to wash and change their clothes in; the mining boss seems to be a competent and practical man; there are no boys working in the mine under 12 years of age; the engineers seem to be practical, experienced and sober men; they do not allow more than 10 men to ride on the safety-carriage at one time; the parties having charge know their duty in case of death or serious accident; the shaft openings are protected by safety-gates.

Capouse Colliery.

This colliery is located in the city of Scranton and situated one and one-fourth miles north-west of the Lackawanna river. The shaft is 130 feet deep to the Diamond and 169 feet deep to the bottom of the Rock vein. They are sinking a new shaft to the lower veins, which is located about 350 feet west of main shaft; it is operated by the Lackawanna iron and coal company. Charles F. Mattes is general superintendent, R. J. Brooks is mining boss and D. Brooks is outside foreman.

Description.—There is a breaker attached to the shaft tower; they mine and prepare 600 tons of coal per day; they employ 66 miners, 64 laborers, 40 drivers, 8 door-boys and 20 company men in the mines; 40 slate pickers, 8 head and plate men, 6 drivers, 9 company men, 7 mechanics and 2 bosses outside; in all 270 men and boys; they are working the Diamond and Rock veins; average thickness of the Diamond 6 feet and of the Rock vein 8 feet; they work headings 15, air-ways 15 and chambers 30 feet wide; they leave pillars 15 feet wide to sustain the roof; they leave cross-entrances from 50 to 60 feet apart for the purpose of ventilation; the roof is rock in both veins; the mines are in a good working condition.

Ventilation is produced by a suction fan; the intake is located at north side of main shaft, area 140 feet; the upcast is located in south side of main shaft, area 70 feet; the amount of pure air in the Diamond is 13,000 and in the Rock 13,300 feet per minute; they have double doors on main traveled roads and an extra one in case of an accident to any of the others; the main doors are hung so as to close of their own accord; they have attendants at main doors; the air is conducted systematically to the face of workings by the aid of check-doors; they have two splits of air in each vein; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use one breaker engine of 40-horse power, two hoisting engines of 80-horse power, one pumping engine of 70-horse power, one fan engine of 10-horse power; they have a metal speaking tube in the mines; they have two safety-carriages with all the modern improvements; they have an adequate brake and flanges of sufficient strength and dimensions for safety attached to the hoisting drum; the ropes, links, chains and connections are in good condition; the boilers have been cleaned and examined and reported in good condition; they have a steam gauge to indicate the pressure of steam; the breaker machinery is boxed and fenced off so that operatives are safe.

Remarks.—They have furnished a map of the mines; they have a second opening for each vein; they have a house for men to wash and change in; the mining boss is a practical and competent man; there are no boys working in the mines under twelve years of age; the engineers seem to be experienced, competent and sober men; they do not allow over ten men to ride on the safety-carriage at one time; they do not allow any person to ride on loaded cars in the mines or on loaded carriages in the shaft; the parties having charge know their duty in case of death or serious accident; the shaft landings are protected by safety-gates.

Mt. Pleasant Colliery.

This colliery is located in the city of Scranton, on the northern division of the Delaware, Lackawanna and Western railroad, and situated one-fourth of a mile north-west of the Lackawanna river; it is operated by the Mount Pleasant coal company. William T. Smith is general superintendent, James R. James is mining boss and Thomas D. Bevan is outside foreman.

Description.—The opening to the coal is a slope driven on an angle of 15°; it is 500 feet to where it strikes the Diamond, 560 feet to where it strikes the Rock, and 700 feet to where it strikes the Big vein of coal; it is 1,200 feet long to where they take the coal out at the basin; there is a breaker connected with these mines, located about 50 feet from main opening; they mine about 350 tons of coal per day; they employ 43 miners, 43 laborers, 20 drivers, 5 runners, 8 door-boys and 14 company men in the mines; 23 slate pickers, 5 head and plate men, 3 drivers, 7 company men, 4 mechanics and 2 bosses outside; in all 177 men and boys; they are working the Diamond and Rock veins, average thickness 7 feet each; they work headings and air-ways from 10 to 12, and chambers 28 feet wide; they leave pillars from 15 to 20 feet wide to sustain the roof; they leave cross-entrances about 60 feet apart for the purpose of ventilation; the roof is good slate; the mines are in a good, safe working condition.

Ventilation is produced by means of furnaces; the intakes are located at mouth of slope, area 54 feet; the upcasts are in furnace air shafts, area 48 feet; the amount of fresh air is 14,500 cubic feet per minute, passing through both veins; the main doors are hung so that they will close of their own accord; they have attendants at main doors; they have double doors on main travelled roads, and an extra one in case of an accident to any of the others; the air is circulated to the face of the workings in one volume in each vein; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use 1 hoisting engine, 70-horse power, and 1 breaker engine, 25-horse power; they have an adequate brake, and flanges of sufficient strength and dimensions for safety attached to their hoisting drum; the links, chains, ropes and connections are in good condition; the boilers have been cleaned and examined and reported in good condition; they have a steam gauge to indicate the pressure of steam; the breaker machinery is boxed and fenced off so that operatives are safe.

Remarks.—They have furnished a map of mines; they have second openings for both veins; they have a house for men to wash and change in; the mining boss seems to be a practical and competent man; he has a fire-boss to assist him; there are no boys working in the mines under 12 years of age; the engineers seem to be experienced, competent and sober men; they do not allow any persons to ride on loaded cars in the mines; the parties having charge know their duty in case of death or serious accident; they are sinking an air-shaft 13 feet in diameter, and it is now down 110 feet; they intend to build a furnace in it when completed; they are working 18 men in it at present.

Fellows' Local Coal Sale Mine.

This mine is located in the city of Scranton, and situated on the west bank of the Lackawanna river. It is operated by J. T. Fellows, Esq. George Perigo has charge of the works, and John Frank is mining boss.

Description.—The opening to the coal consists of a tunnel; there is a breaker connected with this mine, located 500 feet south-west of the mouth of tunnel; they mine and prepare about 80 tons of coal per day; they employ 16 miners and laborers and 4 drivers in the mine; 10 slate pickers, 8 men and boys and 2 bosses outside; in all 40 men and boys; they are working the Diamond vein of coal, average thickness 7 feet; they work headings 14, air-ways 16 and chambers 30 feet wide; they leave pillows 15 feet wide to sustain the roof; they leave cross entrances wherever necessary for the purpose of ventilation; the roof is good slate; the mine is in a good working condition.

Ventilation is produced by the action of the atmosphere; the intake is located at mouth of tunnel in summer, and in second opening in winter; just the reverse for the outcast; the amount of pure air is 4,500 cubic feet per minute; the main doors are hung so as to close of their own accord; the air is conducted to the face of the workings in one volume; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use one breaker engine of 20-horse power, and one small pumping engine of 20-horse power; they require no machinery in the tunnel.

Remarks.—They have furnished a map of mine; they have a second opening in air and pump shaft; they have no house for men to wash or change in; the mining boss seems to be a practical and competent man; there are no boys working in the mine under twelve years of age; the engineers seem to be experienced, competent and sober men; the parties having charge know their duty in case of death or serious accident; the breaker machinery is boxed and fenced off so that operatives are safe.

No. 2 Diamond Shaft.

This shaft is located in the city of Scranton and lies ¼ of a mile north-west of the Lackawanna river; it is 166 feet deep to the Rock vein and 216 feet deep to the G or Big vein; the size of the opening is 36 by 10 feet. It is operated by the Delaware, Lackawanna and Western railroad company. Rees T. Evans is mining boss, and Daniel Lightstaff is outside foreman.

Description.—They have a double breaker located about 500 feet north-east of the shaft; they mine and prepare about 800 tons of coal per day; they employ 40 miners, 40 laborers, 32 drivers, 4 door-boys and 13 company men in the E or Diamond vein; 51 miners, 51 laborers, 35 drivers, 7 door-boys and 20 company men in the G or Big vein; 68 slate pickers, 12 head and plate men, 14 drivers, 27 company men, 12 mechanics and 2 bosses outside; in all 428 men and boys; they use 4 patent hoisting carriages in the shaft, 2 to each vein; the E vein is opened by a rock tunnel from the Rock vein, and the G vein from the bottom of the shaft; the average thickness of the E vein is 6 feet and the G vein 12 feet; in the E vein they work the headings 12, air-ways 18 and chambers 30 feet wide; they leave pillars from 5 to 6 yards wide to sustain the roof; they leave cross-entrances 20 yards apart for the purpose of ventilation; the roof is slate, in some places it is very good and in other places the parties having charge must be very careful in order to keep it up; in the G vein they work headings 12, air-ways 18 and chambers 30 feet wide; they leave pillars from 6 to 8 yards wide to sustain the roof; they leave cross-entrances 20 yards apart for the purpose of ventilation: the roof is good slate and rock; the mines are in a good. safe, working condition.

Ventilation.—The ventilation in both veins is produced by means of furnaces; the in-take in E vein is located in main shaft, it contains an area of 180 feet, and the upcast is in No. 2 slope furnace; the intake for G vein is in main shaft, it contains an area of 180 feet; the up-cast is located in air-shaft, about 300 feet south of main shaft, it contains an area of 42 feet; the amount of fresh air for G vein is 24,000 cubic feet, and for the E vein 10,500 cubic feet per minute; there is noxious and inflammable gas evolved in the G vein; the mines are examined every morning before the men are allowed to go to work, and every evening to see that all the main doors are closed; they have double doors, and an extra door on the main traveled roads in the G vein; the doors are hung so that they will close of their own accord; they have an attendant at all main doors; they have 2 splits of air in the E vein and 3 in the G vein; there are no more than fifty men allowed to work in any one split in the G vein; the air is conducted to the face of the workings systematically by the aid of check-doors; the amount

of ventilation has been measured and reported according to law; ventilation is good in both veins.

Machinery.—The engines in use at this shaft are 1 pair of hoisting engines for each vein, of 90-horse power, 1 pumping engine of 100-horse power, (all in engine room,) 3 steam pumps inside, of 150-horse power, 6 6-horse power pumps also in the mines, 1 breaker engine; they have speaking-tubes in the shaft; they use 4 safety carriages with all the modern improvements; they have flanges on their hoisting drums of sufficient strength for safety; they have adequate brakes on hoisting drums; they use standard wire ropes with clevis and cone attachment; the boilers, feed pipes, water guage cocks, etc., have been cleaned and examined and reported in good condition; they have steam gauges and safety-valves for the purpose of indicating the pressure of steam and for safety; the breaker machinery is boxed and fenced off so that operatives are safe; the shaft-landings are protected by safety-gates.

Remarks.—The company have furnished a map of the mines; they have second openings; the opening used for the E vein is located ¼ of a mile north-west of the shaft and for the G vein about 800 feet from main shaft; they have a house for men to wash and change their clothes in; there is no standing gas or water in the mines; the mining boss is a practical and competent man; he has a fire boss to assist him; there are no boys allowed to work in the mines under 12 years of age; the engineers seem to be experienced, competent and sober men; there are no persons allowed to ride on loaded carriages in the shaft; the rules of the mines compel all persons to walk in and out at the second openings; the parties having charge know their duty in case of death or serious accident; since my last report they have sunk a new air-shaft about ¼ of a mile north-west of the main shaft; it is sunk to the E or Diamond vein and is intended to ventilate the E vein of Diamond mines and Tripp slope workings, both of these mines are connected with it; the company intend to erect a 14-feet fan for each mine.

No. 2 Diamond Slope.

This slope is located in the city of Scranton and lying one-fourth of a mile north-west of the Lackawanna river; it is 375 feet long to the "G" or Big vein; it is 20 feet wide by 8 feet high, and it is driven on an angle of 22½ degrees; it is operated by the Delaware, Lackawanna and Western railroad company. Daniel Phillips is mining boss and Daniel Langstaff is outside foreman.

Description.—There is a double breaker connected with this mine about 50 feet away; they mine and prepare about 400 tons of coal per day; they employ 58 miners, 42 laborers, 24 drivers, 13 door-boys and 17 company men in the mine; 56 slate pickers, 10 head and plate men, 6 drivers, 17 company men, 4 mechanics and 3 bosses outside; in all 250 men and boys; the coal mined at Tripp slope is prepared at this breaker; they are working the "G" or Big vein of coal; average thickness 12 feet; they work headings 12, air-ways 18 and chambers 30 feet wide; they leave pillars from 5 to 7 yards wide to sustain the roof; they leave cross-entrances from 15 to 20 yards apart for the purpose of ventilation; the roof is good slate and rock; the mine is in a good working condition.

Ventilation.—Ventilation is produced by means of a furnace located about 500 feet north of the main opening; the intake is located at the mouth of the slope; it contains an area of 160 feet; the outcast is located at the furnace air shaft; it contains an area of 144 feet; the average supply of pure fresh air is 35,450 cubic feet per minute; there is noxious, poisonous and inflammable gas evolved in the mine; the mine is examined every morning before men are allowed to go to work and every evening to see that the main doors are all closed; the main doors on headings and air-ways are hung so that they will close of their own accord, and they have attendants at each so as to keep them closed and to keep up a steady current of air; they have double doors on main traveled roads and an extra one in case of accident to any of the others; they do not work over fifty men in any one split of air; the amount of ventilation has been measured and reported according to law; ventilation is good.

Machinery.—The engines in use at this mine are two steam-pumps at foot of slope of 150-horse power, one hoisting engine of 80-horse power, one breaker engine of 28-horse power; they have a metal speaking tube in the slope; they have flanges of sufficient strength and dimensions for safety; they have an adequate

brake on hoisting drum; they use standard wire ropes; the boilers have been cleaned and examined and reported in good condition according to law; they have a steam-gauge and safety-valve for safety and to indicate the pressure of steam.

Remarks.—They have furnished a map of the mine; they use No. 2 shaft as a second opening; they have a house for men to wash and change their clothes in; the mining boss seems to be a practical and competent man; he has a fire-boss to assist him; there are no boys working in the mine under twelve years of age; the engineers seem to be experienced, competent and sober men; the men travel in and out the second opening: the parties having charge know their duty in case of death or serious accident: the breaker machinery is boxed and fenced off so that operatives are safe.

Tripps Slope.

This slope is located in the city of Scranton, and lying one-fourth of a mile north-west of the Lackawanna river; it is 800 feet long to coal, and driven on an angle of 13 degrees; it is 8½ feet wide by 6 feet high; it is operated by the Delaware, Lackawanna and Western railroad company. E. R. Walter, general outside superintendent; Benjamin Hughes, general inside foreman; Thomas Houser, mining boss; and D. Langstaff, outside foreman.

Description.—There is a breaker connected with this slope by a trestling and railroad track 1,000 feet long; they mine, prepare and ship about 325 tons of coal per day; they employ 36 miners, 36 laborers, 20 drivers, 4 door-boys and 20 company men inside; this coal is cleaned and prepared at No. 2 Diamond slope breaker; they work in all 116 men and boys; they are working the E or Diamond vein, average thickness 7 feet; they work headings 12, air-ways 18 and chambers 30 feet wide; they leave pillars from 15 to 21 feet wide to sustain the roof; they leave cross-entrances for the purpose of ventilation, about 60 feet apart; the roof is slate and fire clay; the mine is in a good working condition.

Ventilation.—This mine is ventilated by means of a furnace, located about 1,200 feet from main opening; the intake is located at mouth of slope; it contains an area of 51 feet; the upcast is located in furnace air shaft; it contains an area of 36 feet; the average supply of fresh air per minute is 15,000 cubic feet; there are no noxious, poisonous or inflammable gases evolved in this mine; the main doors on headings and air-ways are hung so that they will close of their own accord, so as to assist the ventilation, and they have attendants at them to keep them closed so as to keep up a steady current of air at all times; they have double doors on main traveled roads, but no extra one in case of an accident to the others; the air is circulated to the face of the workings in one volume; the ventilation has been measured and reported according to law; ventilation is good.

Machinery.—They use two hoisting engines 200 feet from mouth of slope of 60-horse power; two steam pumps inside, one is 40-horse power, and the other is 20-horse power; they have a metal speaking tube in the slope, and have flanges, of sufficient dimensions, attached to hoisting drum, with an adequate brake. The boilers, feed pipes, water-gauge cocks, etc., have been cleaned and examined, and reported in good condition; they have a steam gauge, to indicate the pressure of steam per square inch.

Remarks.—They have furnished a map of mines; they have a second opening; they have a house for men to wash and change in; they have no standing gas, but some water in their mines; the mining boss seems to be a practical and competent man; there are no boys working in the mine under 12 years of age; the engineers seem to be practical, experienced and sober men, and do not allow any person to ride on loaded cars in the slope; the parties having charge know their duty in case of death or serious accident.

Brisbin Shaft.

This is a new shaft just sinking; it is located in the city of Scranton, and situated about one-half of a mile north-west of the Lackawanna river; it is 268 feet deep to the Diamond vein; they are now sinking between the Diamond and Rock

veins; the shaft opening is 10 by 36 feet; the Delaware, Lackawanna and Western railroad company are sinking it, under the supervision of Benjamin Hughes, general mine superintendent; they employ about 18 sinkers, 6 head and plate men, 2 company men and 6 mechanics; in all 32 men.

Cayuga Colliery.

This shaft is located in the city of Scranton, and lying one-half of a mile northwest of the Lackawanna river; it is 368 feet to the G or 14-feet vein: shaft opening is 32½ feet long and 10 feet wide; it is operated by the Delaware, Lackawanna and Western railroad company. William R. Storrs is general coal agent, E. R. Walter is general outside superintendent, B. Hughes is general inside foreman, Thomas Watkins is mining boss and J. C. Bowman is outside foreman.

Description.—They have a breaker connected with this mine, attached to shaft tower; they mine, ship and prepare about 450 tons of coal per day; they employ 52 miners, 52 laborers, 19 drivers, 3 door-boys and 14 company men in the mine; 49 slate pickers, 9 head and plate men, 2 drivers, 18 company men, 8 mechanics and 2 bosses outside; in all 228 men and boys; they are working the G or Big vein, average thickness 9 feet; they work headings 12, air-ways 15 and chambers 27 feet wide; they leave pillars from 6 to 7 yards wide to sustain the roof; they leave cross-entrances 20 yards apart for the purpose of ventilation; the roof is slate; the mine is in a good working condition.

Ventilation.—The ventilation is produced by means of a fan adjoining the main opening; the intake is located at the main opening, area 230 feet; the upcast is located in one side of main shaft, area 90 feet; the average supply of fresh air per minute is 18,900 cubic feet; they have a little noxious, inflammable and poisonous gases evolved in the mine; the main doors on headings and air-ways are hung so that they will close of their own accord, so as to assist ventilation, and they have attendants to keep them closed, so as to keep up a steady current of air; they have double doors on main travelled roads, and an extra door in case of accident; the air is circulated to the face of the working places in 2 splits; they work 50 men in one split, and 54 in the other; the amount of ventilation has been measured and reported according to law; ventilation is good.

Machinery.—They use 1 pair of hoisting engines, 120-horse power; 1 breaker engine, 60-horse power, in shaft engine house; 1 fan engine, 60-horse power, in fan engine house; 1 donkey engine at bottom of shaft, 25-horse power, and 1 fire pump, 20-horse power, in a brick building about 100 feet from boiler rooms; they have a metal speaking tube in shaft; they have 2 hoisting carriages in shaft, with all the modern improvements; they have flanges of sufficient dimensions on the hoisting drums; they have an adequate brake on hoisting drum; they use clevis, cones and standard ropes, in good condition; the boilers, feed pipes and water gauge cocks are in good condition; they have a steam gauge and safety valves for safety and to indicate the pressure of steam per square inch.

Remarks.—They have furnished a map of mine; they have a second opening about 1,200 feet from main opening; they have a house for men to wash and change their clothes in; the mining boss seems to be a practical and competent man; there are no boys working in the mine under 12 years of age; they do not allow more than 10 men to ride on a loaded carriage or cage at one time in the shaft; the persons having charge know their duty in case of death or serious accident; the breaker machinery is boxed and fenced off so that operatives are safe; the shaft landings are protected by safety gates.

Von Storch Colliery.

This colliery is located in Scranton city, and situated on the west bank of the Lackawanna river; it is operated by the Delaware and Hudson canal company—E. W. Neston, general superintendent; J. M. Chittenden, general outside breaker superintendent; Andrew Nicol, general mine superintendent; J. C. Simpson and A. B. Nicol, assistant mine superintendents. The above named gentlemen have charge of all the collieries operated by the Delaware and Hudson canal company

in this mining district. Richard D Roberts and John Aubry, are mining bosses, and Charles Ziegler, is outside foreman.

Description.—The opening to the coal consists of a shaft and slope; the shaft is 350 feet deep to the Fourteen Feet vein, and 550 feet deep to the Clark vein; the slope is 1,300 feet long to the G or Big vein, and driven at an angle of — degrees; there is a breaker connected with these mines, situated about 500 feet from mouth of slope; they mine and prepare about 650 tons of coal per day; they employ 92 miners, 78 laborers, 42 drivers, 16 door-boys and 55 company men in the mine; 82 slate pickers, 11 head and plate men, 3 drivers, 26 company men, 8 mechanics and 3 boses outside—in all 416 men and boys; they are working the Fourteen Feet, Diamond and Clark veins of coal; average thickness of the Fourteen Feet 8 feet; Diamond 5½ feet, and of the Clark vein 9 feet; they work headings in Fourteen Feet vein 10, air-ways 14 and chambers 30; in the Diamond vein they work headings and air-ways 14, and chambers 30; and in the Clark vein they work headings 10, air-ways 14, and chambers 30 feet wide; they leave pillars in the Fourteen Feet and Clark veins about 18 feet, and in the Diamond about 15 feet wide, to sustain the roof; they leave cross entrances in each vein 50 feet apart, for the purpose of ventilation; the roof in the Fourteen Feet and Clark veins is slate, and in the Diamond vein it is fire-clay; the mines are in a good working condition.

Ventilation is produced by means of a large fan—this is a suction fan, and is 21 feet in diameter by 5 feet face; the in-take is located at mouth of slope, area 190 feet: the up-cast is located in main shaft, area 100 feet; the amount of pure air in the Fourteen Feet is 21,500, and in the Diamond 19,100 cubic feet per minute; there is standing water in the dip workings of each vein; the main doors are hung so as to close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings systematically by the aid of check-doors; the amount of ventilation has been measured and reported good.

Machinery.—They use one breaker engine of 62-horse power, two hoisting engines of 123-horse power, one hoisting engine used to hoist on the plane outside, 25-horse power, and one steam pump 105-horse power; they have a metal speaking tube in the mines; have two safety carriages, with all the modern improvements; have an adequate brake, and flanges of sufficient strength and dimensions for safety, attached to their hoisting drums; the ropes, links, chains and connections are in good condition; the boilers had been cleaned and examined, and reported in good condition; have a steam guage to indicate the pressure of steam; the breaker machinery is boxed and fenced off, so that operatives are safe.

Remarks.—They have furnished maps of mines; they have second openings; they have no house for men to wash or change in. Mr. Roberts is a competent and practical man, and Mr. Aubry seems to be a practical and competent man. There are no boys working in the mines under 12 years of age; the engineers seem to be experienced, competent and sober men, and do not allow any persons to ride on loaded carriages in the mines, or more than ten persons to ride on the safety carriage at one time: the parties having charge know their duty in case of death or serious accident; the fan is run at the rate of 48 revolutions per minute; it does not give as good results as Legett's Creek fan, on account of the friction, &c: the roof in both veins requires to be well timbered, as it is very bad where faults and rolls come in, and they have to drive the chambers narrow at these places; the shaft landings are protected by safety gates; the mines operated by the Delaware and Hudson canal company will compare favorably with any other mines in Pennsylvania for uniformity and system; they have established a code of mine regulations which they carry out successfully, which prevent a great many deaths and accidents.

Ventilation of a majority of mines in this mining district, and their mode of conducting the air currents to the face of the workings, is systematical; there are some of the mines, operated by this company, connected with old mines that have been worked for years, and it is almost impossible to ventilate them systematically. Alexander Simpson, Esq., is master mechanic of the mining department of this company, and has charge of machinery, &c.; he is a gentleman of ability, and he lives up to the requirements of the law.

Legitt's Creek Colliery.

This colliery is located in the city of Scranton and situated ½ mile north-west of the Lackawanna river; the shaft is 340 feet deep to the G or 14 feet vein. It is operated by the Delaware and Hudson canal company. J. C. Simpson is assistant mine superintendent. Thomas Bamford is mining boss of the Diamond and Finley Ross is mining boss of the G or 14 feet vein, and J. L. Atherton is outside foreman.

Description.—There is a double breaker attached to the shaft tower; they mine and prepare about 500 tons of coal per day; they employ in the Diamond vein 41 miners, 35 laborers, 15 drivers, 21 door-boys and 18 company men; in the G vein 46 miners, 35 laborers, 16 drivers, 8 door-boys and 23 company men; 63 slate pickers, 8 head and plate men, 3 drivers, 6 company men, 10 mechanics and 3 bosses outside; in all 352 men and boys; they are working the Diamond and G veins of coal; average thickness of the Diamond 6 feet, and of the G vein 8 feet; they work headings 9, air-ways 12 and chambers 30 feet wide, except where the roof is very bad; they leave pillars 18 feet wide to sustain the roof; they leave cross-entrances 50 feet apart for the purpose of ventilation; the roof in the Diamond vein is fire clay next to the coal, then rock, and in the G vein it is bony coal; the mines are in a good working condition.

Ventilation is produced by a fan; the in-take is located at mouth of shaft, area 240 feet; the up-cast is located in air-shaft, 500 feet from main opening, area 93 feet; the amount of pure air is 103,925 cubic feet per minute; there is noxious and inflammable gas evolved in these mines; the mines are examined every morning before the men go to work, and every evening to see that the main doors are closed; the main doors are hung so as to close of their own accord; they have attendants at main doors; they have double doors on main traveled roads and an extra one in case of an accident to any of the others; the air is circulated to the face of the workings in six splits; the amount of ventilation has been measured and reported. Ventilation is good.

Machinery.—They use 1 breaker engine of 77-horse power, 2 hoisting engines of 123-horse power, 1 hoisting engine for outside plane of 62-horse power, 1 pumping engine of 105-horse power at second opening, 1 hoisting engine of 77-horse power and 1 fan engine of 49-horse power; they have a metal speaking-tube in the shaft; they have 3 safety carriages with all the modern improvements; they do not allow any persons to ride up or down the main shaft, they are all hoisted and lowered by a safety-carriage in the second opening; they have an adequate brake and flanges of sufficient strength and dimensions for safety attached to the hoisting drum; the ropes, links, chains and connections are in good condition; the boilers have been cleaned and examined and reported in good condition; they have a steam gauge and safety-valve to indicate the pressure of steam; the breaker machinery is boxed and fenced off so that operatives are safe.

Remarks.—They have furnished maps of mines; they have no house for men to wash or change in. Finley Ross, mining boss, is a practical and competent man; Mr. Thomas Bamford seems to be a practical and competent man; they have a fire boss to assist them in each vein; there are no boys working in the mines under 12 years of age; the engineers seem to be experienced, competent and sober men; they do not allow over 10 persons to ride on the safety-carriage at one time; the parties having charge know their duty in case of death or serious accident; they are working a gravity plane in the Diamond vein; the air is conducted systematically, by the aid of check-doors, &c., to the face of the workings by 3 air-splits in each vein; they do not work over 50 men in any one split of air; the fan is 21 feet in diameter by 5 feet face and it runs at the rate of 68 revolutions per minute; the shaft-opening is protected by safety-gates.

Marvin Shaft.

This shaft is located in Scranton city, and situated about 500 feet north-west of the Lackawanna river. This is a new shaft just sinking; it is sunk down to the Diamond vein, which is 155 feet below the surface, average thickness of coal 7 feet; the opening is 10 feet wide by 41 feet long; they are putting up very substantial brick buildings around the shaft for engine house, etc.

Machinery.—They use 2 hoisting engines of 120-horse power, and 2 smaller hoisting engines of 30-horse power; they are now in the act of building a breaker, etc. I gave instructions when I last visited it to put a brake on the drum before they hoist any more men in or out of the shaft.

Rolling Mill Colliery.

This colliery is located in the city of Scranton, and situated on Roaring Brook creek; it is operated by the Lackawanna iron and coal company. C. F. Mattes is general superintendent, and Evan Davis is mining boss.

Description.—The opening to the coal consists of a slope and tunnel; the slope is 1,023 feet long, and driven at an angle of 5° in a south-westerly direction; there is no breaker connected with these mines; all the coal mined here is consumed by the company's rolling mills and blast furnaces; they mine and prepare about 240 tons of coal per day; they employ 90 miners, 18 drivers, 13 door-boys and 7 company men in the mines; 1 head man, 2 drivers, 2 company men, 9 mechanics and 1 boss outside; in all 143 men and boys; they are working the Rolling Mill vein of coal, average thickness 4½ feet; they work headings 9, air-ways 30 and chambers 30 feet wide; they leave pillars 15 feet wide to sustain the roof; they leave cross-entrances 30 feet apart for the purpose of ventilation; the roof is good hard rock; the mines are in a good working condition.

Ventilation is produced by means of furnaces; the intakes are located at mouths of slope and tunnels; the area of intakes for the slope is 72, and for the tunnel 54 feet; the upcasts are located in furnace air-shafts; the area of the upcasts for the slope is 63, and for the tunnel 113 feet; the amount of air in the slope is 9,150, and in the tunnel 14,250 cubic feet per minute; the main doors are hung so as to close of their own accord; they have attendants at main doors; they have double doors on main travelled roads, and an extra one in case of an accident to any of the others; the air is conducted to the face of the workings in one volume in the slope and tunnel; the amount of ventilation has been measured and reported: ventilation is good.

Machinery.—They use two hoisting engines near mouth of slope, 40-horse power each; there is a double acting steam pump in mines, 80-horse power, and 1 feed steam pump; they have no metal speaking tube in the mines; they have an adequate brake, and flanges of sufficient strength and dimensions for safety attached to the hoisting drum; the ropes, links, chains and connections are in good condition; the boilers have been cleaned and examined and reported in good condition; they have a steam gauge to indicate the pressure of steam.

Remarks.—They have furnished a map of mines; they have a second opening: they have a house for men to wash and change in; the mining boss seems to be a practical and competent man; there are no boys working in the mines under 12 years of age; the engineers seem to be experienced, competent and practical men; they do not allow any persons to ride on loaded cars in the mines; the parties having charge know their duty in case of death or serious accident; the stacks over furnace air-shafts are built of brick, 7 feet in diameter in the clear.

Pine Brook Shaft.

This shaft is located in the city of Scranton, and situated about 1,000 feet south-east of the Lackawanna river; it is 175 feet deep to the Clark vein; it is operated by the Lackawanna iron and coal company. Charles F. Mattes is general superintendent, Morgan Bowen is mining boss and Henry Hess is outside foreman.

Description.—There is a breaker attached to the shaft tower; they mine and prepare about 250 tons of coal per day; they employ 37 miners, 34 laborers, 14 drivers, 6 door-boys and 16 company men in the mine; 15 slate pickers, 1 head and plate man, 2 drivers, 8 company men, 6 mechanics and 1 boss outside; in all 140 men and boys. They are working the Clark vein; average thickness 6½ feet; they work headings 14, air-ways 21, and chambers 27 feet wide; they leave pillars 12 feet wide to sustain the roof; they leave cross-entrances 60 feet apart, for the purpose of ventilation; the roof is slate; the mine is in a good working condition.

Ventilation is produced by a fan and furnace; the in-take is located at mouth of shaft, area 140 feet; the up-cast is located in furnace air shaft, area 132 feet; the air shaft is located 2,700 feet south-east of main shaft, and the amount of pure air is 49,500 cubic feet per minute; inflammable gas is evolved in large quantities in this mine; the mine is examined every morning before men go to work, and every evening, to see that the main doors are closed; the main doors are hung so as to close of their own accord; they have attendants at main doors; they have double doors on main traveled road, and an extra one in case of an accident to any of the others; the amount of ventilation has been measured and reported good.

Machinery.—They use 1 breaker engine 30-horse power, 2 hoisting engines 60 horse power, 1 pumping engine 75-horse power, 1 fan engine 10-horse power, 1 donkey pump 15-horse power and 1 fire pump; they have a metal speaking-tube in the shaft; they have two safety-carriages with all the modern improvements; they have an adequate brake, and flanges of sufficient strength and dimensions for safety, attached to the hoisting drum; the ropes, links, chains and connections are in good condition; the boilers have been cleaned and examined, and reported in good condition; they have a steam guage to indicate the pressure of steam; the breaker machinery is boxed and fenced off, so that operatives are safe.

Remarks.—They have furnished a map of mine; they have a second opening; there is a man and mule-way driven to the surface, where men and mules walk in and out; they have no house for men to wash or change in; the mining boss is a competent and sober man, and has the fire-boss to assist him; there are no boys working in the mine under 12 years of age; the engineers seem to be experienced, competent and sober men; they do not allow any person to ride on loaded carriages in the shaft; they do not allow over ten men to ride on the safety-carriages at one time; the parties having charge know their duty in case of death or serious accident; the shaft-opening is protected by safety gates.

Fair Lawn Slope.

This slope is located in the city of Scranton and situated ½ mile south-east of the Lackawanna river; it is a new slope just sinking; it is down 235 feet at an angle of 19 degrees; hosie & Co. are sinking it; they are making preparations to build a breaker in connection with this slope.

Green Ridge Colliery.

This colliery is located in the borough of Dunmore, lying ¼ of a mile south-east of the Lackawanna river. The opening consists of a rock slope; it is 318 feet long. It is operated by Filer & Co. Geo. Filer is general mine superintendent, Timothy Perfrey is mining boss and E. Brownell is outside foreman.

Description.—There is a breaker connected with this mine; it is located 240 feet away; they mine and prepare about 400 tons of coal per day; they employ 60 miners, 55 laborers, 18 drivers, 11 door-boys and 28 company men in the mine; 70 slate pickers, 7 head and plate men, 6 drivers, 23 company men, 4 mechanics and 2 bosses outside; in all 284 men and boys; they are working the Clark vein, average thickness 8 feet; they drive headings 14, air-ways 12 and chambers 28 feet wide; they leave pillars from 15 to 18 feet wide to sustain the roof; they leave cross-entrances 30 feet apart, and closer if necessary, for the purpose of ventilation; the roof is slate; the mine is in a good working condition.

Ventilation is produced by means of a furnace located about 560 feet from main opening; the in-take is located at mouth of slope, area 75 feet; the up-cast is located in furnace air-shaft, area 60 feet; the amount of fresh air is 22,000 cubic feet per minute; the main doors are hung so that they will close of their own accord; they have attendants at main doors; they have double doors on main traveled roads and an extra one in case of an accident to any of the others; the amount of ventilation has been measured and reported. Ventilation is good.

Machinery.—They use 2 hoisting engines, (100 feet from mouth of slope,) of 80-horse power, 1 breaker engine, (100 feet from mouth of slope—steam taken

from boilers of hoisting engine,) of 25-horse power; they have a metal speaking-tube in the slope; they have an adequate brake and flanges of sufficient strength and dimensions for safety attached to the hoisting drums; the boilers have been cleaned and examined and reported in good condition; they have a steam gauge to indicate the pressure of steam.

Remarks.—They have furnished a map of mine; they have a second opening located 560 feet from main opening; they have a house for men to wash and change in; there is very little gas and water in the mine; the mining boss seems to be a practical and competent man; he has a fire boss to assist him; the mine is examined every morning before men go to work, and every evening to see that the main doors are all closed; there are no boys working in the mine under 12 years of age; the engineers seem to be experienced, competent and sober men; they do not allow any persons to ride on loaded cars in the mine; the parties having charge know their duty in case of death or serious accident; the breaker machinery is fenced and boxed off so that operatives are safe.

No. 2 Shaft, Dunmore.

This shaft is located in Dunmore borough and lies 1 mile south-east of the Lackawanna river. It is 53 feet to first vein, which is abandoned, and No. 2 vein is worked by a rock tunnel 600 feet from the bottom of shaft; size of shaft 12 by 15 feet. It is operated by the Pennsylvania coal company. William Bryden is general mine superintendent, Jas. M'Miller is mining boss and J. W. Marchell is outside foreman.

Description.—There is no breaker connected with this mine but there are large schutes where they load large railroad cars and run them to the screens in Dunmore, where the coal is cleaned and prepared; they mine and prepare about 240 tons of coal per day; they employ 40 miners, 40 laborers, 7 drivers, 2 door-boys and 6 company men in the mine; 14 head and plate men and 1 boss outside; in all 110 men and boys; they are working the lowest vein of coal, average thickness 4 feet; they work headings 10, air-ways 15 and chambers 30 feet wide; they leave pillars from 15 to 21 feet wide to sustain the roof; they leave cross-entrances from 25 to 40 feet apart for the purpose of ventilation; the roof is bony coal and slate; the mine is in a good working condition.

Ventilation is produced by means of a furnace located 2,000 feet from main opening; the in-take is located in old No. 1 shaft and in main shaft, area from 145 to 150 feet; the up-cast is located in furnace air-shaft, area 60 feet; the amount of fresh air is 13,500 cubic feet per minute; the main doors on headings and air-ways are hung so that they will close of their own accord; they have attendants at main doors; they have double doors on main traveled roads and an extra one in case of an accident to any of the others; the air is circulated to the face of the workings in 2 splits; the amount of ventilation has been measured and reported according to law; ventilation is good.

Machinery.—They use 1 hoisting engine with pumping gear attached, 40-horse power; they have a metal speaking-tube in the shaft; they have an adequate brake and flanges of sufficient strength and dimensions for safety attached to the sides of the hoisting drum; the ropes, links, chains and connections are in good condition; the boilers have been cleaned and examined and reported in good condition; they have a steam gauge to indicate the pressure of steam.

Remarks.—They have furnished a map of mine; they have a slope to surface and they are connected with old No. 1 shaft workings, which can be used as a second opening; they have no house for men to wash or change their clothes in; the mining boss seems to be a practical and competent man; there are no boys working in the mines under 12 years of age; the engineers seem to be experienced, competent and sober men; they use 2 patent safety-carriages in the shaft; they do not allow more than 10 persons to ride on a safety-carriage at one time; they have been working both veins in the beginning of the year 1872; the shaft-landings are protected by safety-gates.

Roaring Brook Colliery.

This colliery is located in the borough of Dunmore, and lying one and one-half miles south-east of the Lackawanna river. The shaft is 211 feet deep to the upper vein, 246 feet deep to the middle vein, and 294 feet deep to the lower vein; the opening is 10 by 21 feet. It is operated by the Roaring Brook coal company. J. R. Davis is general mine superintendent, Patrick Mongan is mining-boss and C. W. Baxter is outside foreman.

Description.—There are two breakers connected with these mines—one is connected to the shaft tower, in which they prepare coal for local coal sales, and the other is forty-five hundred feet south-east, connected by a plane and railroad to the shaft; it is situated on the southern division of the Delaware, Lackawanna and Western railroad; they mine and prepare about 650 tons of coal per day; they employ 70 miners, 70 laborers, 49 drivers, 7 door-boys and 37 company men in the mines; 35 slate pickers, 6 head and plate men, 8 drivers, 30 company men, 13 mechanics and 3 bosses outside—in all 327 men and boys; there was a large fall in the lower vein on the 31st of December; they are working these veins, which are called Nos. 1, 2 and 3 veins; average thickness of each 5 feet; they work headings and air-ways from 10 to 12, and chambers about 33 feet wide; they leave pillars about 13 feet wide to sustain the roof; they have cross-entrances about 25 feet apart, for the purpose of ventilation; the roof is of a schaly and fire-clay nature, which is effected by being exposed to the air, as it causes it to break up into small particles, becomes dangerous, and requires a great deal of care and timber to secure it; the mines are not in a good working condition at present.

Ventilation is produced by means of a furnace, located two hundred and twenty-five feet from main opening; the in-take is located in main shaft, area 160 feet; the up-cast is located in furnace air shaft, area 80 feet, and the amount of fresh air is about 28,000 cubic feet per minute; the main doors are hung so that they will close of their own accord; they have attendants at main doors; they have double doors on main traveled roads, and an extra one in case of an accident to any of the others; the air is circulated to the face of the workings in three splits; the amount of ventilation has been measured and reported; ventilation is generally good.

Machinery.—They use two hoisting engines at shaft of 70-horse power, 1 pumping engine of 60-horse power, 1 breaker engine of 10-horse power running small breaker, 1 breaker engine of 35-horse power running large breaker, 1 engine for hoisting the men, of 25-horse power, 2 engines for hoisting up planes of 40-horse power; they have a metal speaking-tube in the shaft; they have two safety-carriages, with all the modern improvements; they have an adequate brake, and flanges of sufficient strength and dimensions for safety, attached to the sides of the hoisting drum; they use standard ropes and links; the boilers have been cleaned and examined, and reported in good condition; they have a safety valve to indicate the pressure of steam.

Remarks.—They have furnished a map of mines; they have a second opening, located 225 feet from main opening; they have a house for men to wash and change in; the mining boss seems to be a practical and competent man; there are no boys working in the mines under 12 years of age; the engineers seem to be experienced, competent and sober men; they do not allow any person to ride on loaded cars in the mines; they do not allow over ten men to ride on the safety carriage at one time; the parties having charge know their duty in case of death or serious accident; the shaft opening is protected by safety gates; the breaker machinery is boxed and fenced off, so that operatives are safe.

Gipsy Grove Colliery.

Description.—This colliery is located in the borough of Dunmore, and it is situated 2 miles south-east of the Lackawanna river; the shaft is 60 feet deep to the First vein, 102 feet deep to the Second vein and 167 feet deep to the Third vein; the opening is 12 by 18 feet; they are also working 4 tunnels, namely, Finnerty's, Swartz's, Smith's and Sawyer's; the shaft and the 3 tunnels first mentioned are working in the Dunmore upper vein, and the last mentioned in the Clark vein; the average thickness of each vein is 4½ feet; they work headings 10, air-ways 15

and chambers 30 feet wide; they leave pillars about 15 feet wide to sustain the roof; they leave cross-entrances from 20 to 30 feet apart for the purpose of ventilation; the roof is good slate and sandstone in the Dunmore upper vein, and bony coal and slate in the Clark vein; there are no chambers opened in the shaft or Smith's tunnel yet; they have second openings to all the workings; the mines are in a good safe working condition.

Ventilation is produced by means of furnaces; the furnace in the shaft is located 900 feet from main opening; Finnerty's tunnel, 850 feet from mouth; Swartz's tunnel, 800 feet from mouth; Smith's tunnel, not working now, and in Sawyer's tunnel 200 feet from mouth; the intakes are located in the shaft and in the opening of all the tunnels; the areas of intakes and upcasts vary from 40 to 60 feet; the amount of pure fresh air at shaft is 3,200, at Finnerty's tunnel is 9,560, at Swartz's tunnel is 6,357, at Smith's tunnel air is not measured, and at Sawyer's tunnel is 6,200 cubic feet per minute; there is no noxious or inflammable gas evolved in the mines; the main doors are hung so that they will close of their own accord; they have attendants at main doors; they have double doors on main travelled roads; the amount of ventilation has been measured and reported; ventilation is good; the air is circulated systematically to the face of the workings; the air currents are good, but not sufficient to keep the mines clear of powder smoke; as the veins are low and the coal hard, it requires a large amount of powder for the miners to complete their day's work.

Machinery.—There is no machinery required at any of the tunnels, as they are driven so as to drain the workings; they use 2 engines at the shaft, 30-horse power each; one is used for hoisting, and the other to run the breaker machinery; also a large pumping engine, —— horse power; they have a metal speaking tube in the shaft; they have a safety carriage, with all the modern improvements; they have flanges of sufficient strength and dimensions for safety attached to the sides of the hoisting drum; they have an adequate brake on hoisting drum; the ropes, links, chains and connections are in good condition; the boilers have been cleaned and examined and reported in good condition; they have a steam gauge and safety valves for safety and to indicate the pressure of steam; the breaker machinery is boxed and fenced off so that operatives are safe.

Remarks.—This colliery is operated by the Pennsylvania coal company. William Bryden is mine superintendent, Jas. M'Millan is mining boss and William Jennings is outside foreman. There is a double breaker attached to the shaft-tower; they mine and prepare about 430 tons of coal per day; they employ in the shaft 10 miners and 6 laborers, and outside 30 slate pickers, 16 head and plate men, 3 drivers, 2 company men, 7 mechanics and 2 bosses; at Finnerty's tunnel 32 miners, 32 laborers, 7 drivers, 3 door-boys and 3 company men in the mines and 2 outside drivers; in Swartz's tunnel 10 miners, 8 laborers, 2 drivers, 1 door-boy and 1 company man, and at Sawyer's tunnel 20 miners, 20 laborers, 4 drivers, 2 door-boys and 2 company men in the mines and 2 drivers outside; in all 227 men and boys; they have furnished a map of mine; they have a house for men to wash and change their clothes in; the mining boss seems to be a practical and competent man; there are no boys working in the mines under 12 years of age; the engineers seem to be experienced, competent and sober men; they do not allow any persons to ride on loaded carriages in the shaft; they do not allow over 10 persons to ride on the safety-carriage at one time; the parties having charge know their duty in case of death or serious accident; the shaft-landing is protected by safety-gates.

The Screens in Dunmore

are located at the head of plane No. 6, on the loaded track of the Pennsylvania coal company's railroad. They screen and clean the coal here which is shipped from the different mines belonging to the company which have no breaker connected with them; they employ 73 men and boys working about the screens; they cleaned and screened in the year 1872, 146,465 tons of coal; they use 1 engine here of 40-horse power.

New Breaker in Dunmore.

This breaker is located on No. 6 plane, on the loaded track of the Pennsylvania coal company's railroad. It is a new double breaker, built with all the modern improvements; they have done but very little work at this breaker in 1872, as they only prepared and shipped 7,774 tons of coal; they employ 15 men and boys around this breaker; they use 1 engine here of 25-horse power to run the breaker machinery.

Elk Hill Colliery.

This colliery is located in Blakeley township, and situated about one-fourth of a mile north-west of the Lackawanna river. It is operated by Elk Hill coal company—L. E. Judd is general mine superintendent, Benjamin Reese is mining-boss and John G. Wyland is outside foreman.

Description.—There is a breaker connected with this mine, located about 1,000 feet north-east of the mouth of drift; they mine about 300 tons of coal per day; they employ 51 miners, 40 laborers, 16 drivers, 8 door-boys and 4 company men in the mine; 32 slate pickers, 6 head and plate men, 2 drivers, 4 company men, 4 mechanics and 2 bosses outside; in all 169 men and boys; they are working No. 2 vein; average thickness 7½ feet; they work headings 11, air-ways 16, and chambers about 30 feet wide; they leave pillars about 10 feet wide to sustain the roof; they leave cross-entrances about 50 feet apart, for the purpose of ventilation; the roof is good rock. The mine is in a good safe working condition.

Ventilation is produced by means of a furnace; the in-take is located at mouth of drift, area 48 feet; the up-cast is located in furnace air-shaft, area 55 feet; the amount of pure air is 20,000 cubic feet per minute; the main doors are so hung, that they will close of their own accord; they have attendants at main doors; they have double doors on main traveled roads, and an extra one in case of an accident to any of the others; the amount of ventilation has been measured and reported; ventilation is generally good.

Machinery.—They use one breaker engine of 40-horse power; the boilers have been cleaned and examined, and reported in good condition; there is no machinery required at the drift.

Remarks.—They have furnished a map of mines; they have a second opening; they have a house for men to wash and change in, if they are disposed to use it; the mining boss seems to be a practical and competent man; he has no fire-boss to assist him; there are no boys working in the mines under 12 years of age; the engineer seems to be a practical, competent and sober man; the parties having charge know their duty in case of death or serious accident; the breaker machinery is boxed and fenced off, so that operatives are safe. This mine was opened and worked on the old style, by driving a heading only, and opening chambers off it, making the air-way of the first cross-entrance that was cut from one chamber to another, after they were opened out, which was a very bad way to ventilate a mine. In the new workings they are driving air-ways along the headings, so as to carry air with them, and in course of time their mine will be in a good condition.

No. 2 or Dip Mine.

This mine is located in Olyphant, Blakeley township, and is situated on Eddy creek, 500 feet south-east of the Lackawanna river; it is operated by the Delaware and Hudson canal company. A. B. Nicol is assistant mine superintendent, R. K. Laidler is mining boss and R. E. Alexander is outside foreman.

Description.—The opening to the coal consists of a tunnel; there is a breaker connected with this mine, located 350 feet from mouth of tunnel; they mine and prepare 400 tons of coal per day; they employ 56 miners, 56 laborers, 25 drivers, 6 door-boys and 9 company men in the mines; 24 slate pickers, 4 head and plate men, 1 driver, 11 company men, 3 mechanics and 2 bosses outside; in all 197 men and boys; they are working No. 1 vein of coal, average thickness 7½ feet; they

work headings 10, air-ways 14 and chambers 30 feet wide; they leave pillars 15 feet wide to sustain the roof; they leave cross-entrances 50 feet apart for the purpose of ventilation; the roof is slate; the mine is in a good working condition.

Ventilation is produced by means of a furnace; the intake is located at mouth of tunnel, area 36 feet; the outcast is located in furnace air-shaft, area 42 feet; the amount of pure air is 9,660 cubic feet per minute; they have double doors on main travelled roads; the main doors are hung so as to close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings in one volume; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use 1 breaker engine, 70-horse power; the boilers have been cleaned and examined and reported in good condition; they have a steam gauge to indicate the pressure of steam; the breaker machinery is boxed and fenced off so that operatives are safe; they require no machinery around the tunnel.

Remarks.—They have furnished a map of mine; they have a second opening; they have no house for men to wash or change in; there is some standing water in the mine; the mining boss seems to be a practical and competent man; there are no boys working in the mine under 12 years of age; the engineer seems to be a practical, experienced and sober man; the parties having charge know their duty in case of death or serious accident.

Eddy Creek Shaft.

This shaft is located in Olyphant, Blakeley township, and situated on Eddy creek, 500 feet south-east of the Lackawanna river; the shaft is 408 feet deep to No. 2 vein of coal; it is operated by the Delaware and Hudson canal company. A. B. Nicol is assistant mine superintendent, R. K. Laidler is mining boss and R. E. Alexander is outside foreman.

Description.—There is a breaker connected with this mine, located 350 feet from main shaft; they mine and prepare 100 tons of coal per day; they employ 14 miners, 14 laborers, 6 drivers and 4 company men in the mine; 2 head and plate men, 4 mechanics and 1 boss outside; in all 45 men and boys; they are working the No. 2 vein of coal, average thickness 5½ feet; they work headings 10, air-ways 14 and chambers 36 feet wide; they leave pillars 15 feet wide to sustain the roof; they leave cross-entrances 50 feet apart for the purpose of ventilation; the roof is fire clay; the mine is in a good working condition.

Ventilation is produced by means of a water-fall; the intake is located in second opening, area 42 feet; the upcast is located in main opening, area 60 feet; the amount of pure air is 18,000 cubic feet per minute; the main doors are hung so as to close of their own accord; they have attendants at main doors; the intake is in second opening, and traverses the workings of No. 2 vein, then goes down the main shaft to the lower vein, goes through all the workings and comes up the main shaft; there is noxious gas evolved in the lower vein, not working now; the air is circulated to the face of the workings in one volume; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use 2 hoisting engines, 118-horse power; 1 pumping engine, 77-horse power, and 1 steam pump, 66-horse power; they have a metal speaking tube in the shaft; they have a safety carriage, with all the modern improvements; they have an adequate brake, and flanges of sufficient strength and dimensions for safety attached to the hoisting drum; the shaft is protected by vertical gates; the ropes, links, chains and connections are in good condition; the boilers have been cleaned and examined and reported in good condition; they have a steam gauge to indicate the pressure of steam.

Remarks.—They have furnished a map of mine; they have a second opening; they have no house for men to wash or change in; the mining boss seems to be a practical and competent man; there are no boys working in the mine under 12 years of age; the engineers seem to be experienced, competent and sober men; they do not allow any persons to ride on loaded carriages in the shaft; they do not allow more than 10 persons to ride on the safety carriage at one time; the parties having charge know their duty in case of death or serious accident.

No. 1 Colliery—Olyphant.

This colliery is located in Olyphant, Blakeley township, and situated 1,000 feet south-east of the Lackawanna river, on the loaded track of the Delaware and Hudson canal company; A. B. Nicol is assistant mine superintendent, Andrew Patten is mining boss and William Bell is outside foreman.

Description.—There is a breaker connected with these mines; they mine and prepare 400 tons of coal per day; they employ 65 miners, 53 laborers, 35 drivers, 9 door-boys and 9 company men in the mines; 38 slate pickers, 6 head and plate men, 22 company men, 3 mechanics and 2 bosses outside; in all 242 men and boys; they are working Nos. 1 and 2 veins of coal; average thickness 7½ feet each; they work headings 10, air-ways 14 and chambers 30 feet wide: they leave pillars 15 feet wide to sustain the roof; they leave cross-entrances 50 feet apart, for the purpose of ventilation; the roof is slate and fire-clay; the mines are in a good working condition.

Ventilation is produced by means of a furnace; the in-take is located at mouth of slope for the slope, and at mouth of drift for drift; areas 57 feet each; the out-casts are located in furnace air-shaft; area 50 feet; the amount of pure air is 9,300 cubic feet per minute; the main doors are hung so as to close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings in one volume; the amount of pure air has been measured and reported; ventilation is good.

Machinery.—They use one breaker engine of 36-horse power, and one hoisting engine of 43-horse power; they have a metal speaking-tube in the slope; they have an adequate brake, and flanges of sufficient strength and dimensions for safety, attached to the hoisting drum; the ropes, links, chains and connections are in good condition; the boilers have been cleaned and examined, and reported in good condition; they have a steam gauge to indicate the pressure of steam; the breaker machinery is boxed and fenced off, so that operatives are safe.

Remarks.—They have furnished a map of mines; they have a second opening; they have no house for men to wash or change in; the mining boss is a competent and practical man; there are no boys working in the mines under 12 years of age; the engineers seem to be experienced, competent and sober men; they do not allow any persons to ride on loaded cars in the mines; the parties having charge know their duty in case of death or serious accident.

No. 3 Colliery—Olyphant.

This colliery is located in Olyphant, Blakely township, and situated 1,000 feet south-east of the Lackawanna river, on the loaded track of the Delaware and Hudson canal company's railroad. It is operated by the Delaware and Hudson canal company. Andrew B. Nicol is assistant mine superintendent, and Andrew Patten is mining boss.

Description.—The opening to the coal consists of a slope and tunnel; the slope is 327 feet long; the coal mined here is prepared at No. 1 breaker; they mine 60 tons of coal per day; they employ 14 miners, 10 laborers, 5 drivers and 2 company men in the mines; in all 31 men and boys; they are working No. 2 vein of coal; average thickness 5½ feet; they work headings 10, air-ways 14 and chambers 30 feet wide; they leave pillars 15 feet wide to sustain the roof; they leave cross-entrances 50 feet apart, for the purpose of ventilation; the roof is fire-clay; the mines are in a good working condition.

Ventilation is produced by means of a furnace; the in-takes are located at mouth of slope and drift, area 50 feet; the out-casts are located in furnace air-shaft, area 45 feet; the amount of pure air is 8,400 cubic feet per minute; the main doors are hung so as to close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings in one volume; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They did use two breaker engines, 86-horse power, at the breaker now abandoned; they have an adequate brake, and flanges of sufficient strength and dimensions for safety, attached to the hoisting drum; the ropes, links, chains and connections are in good condition; the boilers were cleaned and examined, and reported in good condition; they have a steam gauge to indicate the pressure of steam.

Remarks.—They have furnished a map of mines; they have a second opening: they have no house for men to wash or change in; there are no boys working in the mines under 12 years of age; the parties having charge know their duty in case of death or serious accident.

Grassy Island Colliery.

This colliery is located in Blakeley township, and situated about one-half of a mile south-east of the Lackawanna river; the shaft is —— feet deep to the Fourteen Feet vein: it is operated by the Delaware and Hudson canal company. David M'Donald is mining boss, and J. G. Bell is outside foreman.

Description.—There is a breaker connected with this mine, about 3,700 feet away from main opening: they mine and prepare about 575 tons of coal per day; they employ 140 miners, 50 laborers, 34 drivers, 13 door-boys and 21 company men in the mines; 40 slate pickers, 9 head and plate men, 4 drivers, 9 company men, 12 mechanics and 2 bosses outside; in all 334 men and boys; they are working the Fourteen Feet vein of coal, average thickness 10 feet; they work headings 10, air-ways 14 and chambers 30 feet wide; they leave pillars 15 feet wide to sustain the roof; they leave cross-entrances about 50 feet apart for the purpose of ventilation; the roof is rock; the mine is in a good working condition.

Ventilation is produced by means of a furnace; the in-take is located at mouth of shaft, area 144 feet; the up cast is located in furnace air-shaft, area 49 feet; the amount of pure fresh air is 40,200 cubic feet per minute; the main doors are hung so that they will close of their own accord; they have attendants at main doors; they have double doors on main traveled roads, and an extra one in case of accident to any of the others; the air is circulated to the face of the workings in 2 splits; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use 1 breaker engine, 61 3-5-horse power; 1 hoisting engine, 72-horse power; 1 hoisting engine, 77-horse power, and 1 steam pump, 97½-horse power; they have a metal speaking tube in the shaft; they have a safety carriage, with all the modern improvements; they have an adequate brake, and flanges of sufficient strength and dimensions attached to their hoisting drums; the boilers have been cleaned and examined and reported in good condition; they have a steam gauge to indicate the pressure of steam; also a safety valve for safety.

Remarks.—They have furnished a map of mine; they have a second opening, located about 1,100 feet away from main opening; they have no house for men to wash or change in; they have standing water in the mine; the mining boss seems to be a practical and competent man; there are no boys working in the mine under 12 years of age; the engineers seem to be experienced, competent and sober men; they do not allow any persons to ride on loaded cars in the mine; they do not allow more than ten men to ride on the safety carriage at one time; the parties having charge know their duty in case of death or serious accident; the shaft landings are protected by safety gates; the breaker machinery is fenced and boxed off so that operatives are safe; they have 1 locomotive, 20-horse power, to transport coal from the mine to the breaker.

Eaton & Company's Colliery.

This colliery is located at Archbald, in Blakeley township, and situated on the east bank of the Lackawanna river. It is operated by Eaton & Co. Alva Eaton is general superintendent, James Eaton is mining boss and George W. Eaton is outside foreman.

Description.—The opening to the coal consists of four tunnels; there is a breaker connected with these mines; they mine and prepare about 500 tons of coal per day; they employ 104 miners, 100 laborers, 42 drivers, 8 door-boys and 4 company men in the mines; 60 slate pickers, 15 head and plate men, 2 drivers, 7 mechanics and 2 bosses outside; in all 344 men and boys; they are working the Lackawanna vein; average thickness 10 feet; they work headings 10, air-ways 16 and chambers 26 feet wide; they leave pillars about 14 feet wide to sustain the

roof; they leave cross-entrances about 50 feet apart, for the purpose of ventilation; the roof is sandstone rock; the mines are in a good working condition.

Ventilation is produced by the pressure of the atmosphere; the in-takes are located at mouth of tunnels, area 42 feet each; the out-casts are located in the air-shafts, area 35 feet each; the amount of pure air is 13,750 cubic feet per minute; the main doors are hung so that they will close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings in one volume; ventilation is generally good.

Machinery.—They use 1 breaker engine and 1 hoisting engine at breaker, and 1 hoisting engine to hoist on the planes outside, 25-horse power each; the boilers have been cleaned and examined, and reported in good condition; they have a steam gauge to indicate the pressure of steam; the breaker machinery is boxed and fenced off, so that operatives are safe; they require no machinery at the tunnels.

Remarks.—They have furnished a map of mines; they have a second opening for each tunnel; they have no house for men to wash or change in; the mining boss seems to be a practical and competent man; he has no fire-boss to assist him; there are no boys working in the mines under 12 years of age; the engineers seem to be practical, competent and sober men; the parties having charge know their duty in case of death or serious accident.

Ventilation is produced by the action of the atmosphere, therefore the in-takes in winter will be the out-cast in summer; when the temperature is the same in the mines as it is outside, there cannot be any ventilation; there has been no complaints from the miners on account of bad air in the mines.

White Oak Colliery.

This colliery is located at Archbald, in Blakeley township, and situated on the east bank of the Lackawanna river; the opening to the coal consists of 2 tunnels and a slope: it is operated by the Delaware and Hudson canal company. Nicholas George is mining boss, and Thomas Law is outside foreman.

Description.—There is a breaker connected with these mines, located about 600 feet from mouth of tunnels; they mine and prepare about 450 tons of coal per day; they employ 110 miners, 85 laborers, 33 drivers, 8 door-boys and 14 company men in the mines; 54 slate pickers, 4 head and plate men, 5 drivers, 4 company men, 7 mechanics and 2 bosses outside; in all 326 men and boys; they are working the Bottom vein of coal, average thickness 10 feet; they work headings 10, air-ways 14 and chambers 36 feet wide; they leave pillars from 12 to 14 feet wide to sustain the roof; they leave cross-entrances about 50 feet apart for the purpose of ventilation; the roof is good rock; the mines are in a good working condition.

Ventilation is produced by means of a furnace; the in-take is located at mouth of tunnels, area 36 feet; the up-casts are located in furnace air-shaft, area 48 feet; the amount of pure air is 11,860 cubic feet per minute; the main doors are hung so that they will close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings in one split; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use 1 breaker engine, 61½-horse power; there is no machinery required at the tunnels.

Remarks.—They have furnished a map of mine; they have a second opening; they have no house for men to wash or change in; the mining boss seems to be a practical and competent man; there are no boys working in the mines under 12 years of age; the engineer seems to be a practical and sober man; the parties having charge know their duty in case of death or serious accident; the breaker machinery is boxed and fenced off so that operatives are safe; they have not opened any chambers in the slope yet; they are driving heading and air-way to find the basin of the coal.

No. 1 Shaft Colliery.

This colliery is located in Gibsonburg borough, and situated about 500 feet south-east of the Lackawanna river; the opening to the coal consists of a shaft and drift: the shaft is 100 feet deep to the Carbondale vein; it is operated by John Jermyn, Esq. John Jermyn is general superintendent, Robert Carter is mining boss and John Knight is outside foreman.

Description.—There is a breaker connected with this mine, located about 100 feet from shaft; they mine and prepare about 500 tons of coal per day; they employ 100 miners, 75 laborers, 25 drivers, 4 door-boys and 6 company men in the mine; 50 slate pickers, 6 head and plate men, 5 drivers, 30 company men, 8 mechanics and 2 bosses outside; in all 311 men and boys; there are 2 self-acting planes in the mine, 600 feet long each; they are working the Carbondale vein, average thickness 11 feet; they work headings and air-ways 11 and chambers 36 feet wide; they leave pillars from 15 to 18 feet wide to sustain the roof; they leave cross-entrances 60 feet apart for the purpose of ventilation; the roof is solid rock; the mine is in a good safe working condition.

Ventilation is produced by means of a furnace; the in-take is located in hoisting shaft for the shaft, and at mouth of tunnel for tunnel; area of shaft is 80 feet, and area of tunnel is 42 feet; the up-casts for shaft and drift are located in furnace air-shaft, area 80 feet; the amount of fresh air is 17,840 cubic feet per minute; the main doors are hung so that they will close of their own accord; they have attendants at main doors: they have double doors on main traveled roads, and an extra one in case of an accident to any of the others; the air is circulated to the face of the workings in three splits; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use 1 breaker engine, 25-horse power, and 1 hoisting and pumping engine, 60-horse power; they have a metal speaking tube in the shaft; they have a safety carriage, with all the modern improvements; they have an adequate brake, and flanges of sufficient strength and dimensions for safety attached to the hoisting drum; the boilers have been cleaned and examined and reported in good condition; they have a steam gauge to indicate the pressure of steam; the breaker machinery is boxed and fenced off so that operatives are safe.

Remarks —They have furnished a map of mine; they have a second opening; they have a house for men to wash and change in; the mining boss seems to be a practical and competent man; he has no fire-boss to assist him; there are no boys working in the mine under 12 years of age; the engineers seem to be experienced, competent and sober men; the parties having charge know their duty in case of death or serious accident; the shaft landing is protected by safety gates.

Jermyn's Slope Colliery.

This slope is located in Gibsonburg borough, and situated about one-half of a mile south-east of the Lackawanna river. It is operated by John Jermyn, Esq. John Jermyn is general superintendent, Alfred Green is mining boss and Peter Merritt is outside foreman.

Description.—There is a breaker connected with this mine, located about 300 feet away; they mine and prepare 650 tons of coal per day; they employ 120 miners, 120 laborers, 20 drivers, 6 door-boys and 6 company men in the mine; 50 slate pickers, 7 head and plate men, 3 drivers, 30 company men, 5 mechanics and 2 bosses outside; in all 369 men and boys; there are two self-acting planes inside, 600 feet long each; they are working the Carbondale vein; average thickness 11 feet; they work headings and air-ways 11, and chambers 36 feet wide: they leave pillars 15 feet wide to sustain the roof; they leave cross-entrances 60 feet apart, for the purpose of ventilation; the roof is solid rock; the mine is in a good safe working condition.

Ventilation is produced by a furnace; the in-take is located at mouth of slope, area 75 feet; the up-cast is located in air-shaft, area 80 feet; the amount of pure air is 18,750 cubic feet per minute; the main doors are hung so as to close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings in 3 splits; the amount of ventilation has been measured and eported; ventilation is good.

Machinery.—They use 2 hoisting engines, 25-horse power each, and 1 breaker engine of 25-horse power; they have a metal speaking-tube in the slope; they have flanges of sufficient strength and dimensions for safety attached to the hoisting drum; the boilers have been cleaned and examined, and reported in good condition; they have a steam gauge to indicate the pressure of steam; the breaker machinery is boxed and fenced off, so that operatives are safe.

Remarks.—They have furnished a map of mine; they have a second opening; they have a house for men to wash and change in; the mining boss seems to be a practical and competent man; he has no fire-boss to assist him; there are no boys working in the mine under 12 years of age; the engineers seem to be experienced, competent and practical men; they do not allow any persons to ride on loaded cars in the mine; the parties having charge know their duty in case of death or serious accident.

Erie Colliery.

This colliery is located in Carbondale township, and situated 1,000 feet south-east of the Lackawanna river. The shaft is 183 feet deep to the Carbondale vein. It was operated by the Glenwood coal company, now in bankruptcy. Edward Jones is general mine superintendent and John C. Evans is mining boss.

Description.—There is a breaker attached to the shaft tower; they mine and prepare 200 tons of coal per day; they employ 34 miners, 34 laborers, 10 drivers, 3 door-boys and 3 company men in the mine; 48 slate pickers, 5 head and plate men, 1 driver, 4 company men, 6 mechanics and 2 bosses outside; in all 149 men and boys; they are working the Carbondale vein of coal; average thickness 10½ feet; they work headings 12, air-ways 14 and chambers 45 feet wide; they leave pillars 14 feet wide to sustain the roof; they leave cross-entrances 30 feet apart, for the purpose of ventilation; the roof is rock and sandstone; the mine is in a good working condition.

Ventilation is produced by a furnace; the in-take is located in main shaft, area 210 feet; the up-cast is located in furnace air-shaft, area 140 feet; the amount of pure air is 14,000 cubic feet per minute; the main doors are hung so as to close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings in two splits; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use 1 breaker engine, 25-horse power, 2 hoisting engines, 30-horse power each, and 1 pumping engine of 60-horse power; they have a metal speaking-tube in the shaft; they have an adequate brake, and flanges of sufficient strength and dimensions for safety, attached to the hoisting drum; they use one safety carriage, with all the modern improvements; the ropes, links, chains and connections are in good condition; the boilers have been cleaned and examined, and reported in good condition; they have a steam gauge to indicate the pressure of steam; the breaker machinery is boxed and fenced off, so that operatives are safe.

Remarks.—They have furnished a map of mine; they have a second opening; they have a house for men to wash and change in; the mining boss seems to be a practical and competent man; there are no boys working in the mine under 12 years of age; the engineers seem to be experienced, competent and sober men; they do not allow over ten men to ride on the safety carriage at one time; they do not allow any persons to ride on loaded carriages in the shaft; the parties having charge know their duty in case of death or serious accident; the shaft landings are protected by safety gates.

Powderly Slope.

This slope is located in the township of Carbondale, and situated one-fourth of a mile south-east of the Lackawanna river; it is —— feet long to the Top and Bottom Carbondale vein; the opening is 6 by 12 feet, and driven at an angle of — degrees; it is operated by the Delaware and Hudson canal company. Andrew B. Nicol is assistant mine superintendent, James Nicol is mining boss and William Bowers is outside foreman.

Description.—The coal mined here is prepared at Rackett's Brook breaker; they mine 550 tons of coal per day; they employ 64 miners, 51 laborers, 17 drivers, 4 door-boys and 8 company men in the mines; 2 slate pickers, 12 head and plate men, 1 driver, 1 company man, 6 mechanics and 2 bosses outside; in all 168 men and boys; they are working the Top and Bottom Carbondale veins of coal, average thickness 5½ feet each; they work headings 10, air-ways 14 and chambers 36 feet wide; they leave pillars 15 feet wide to sustain the roof; they leave cross-entrances 50 feet apart for the purpose of ventilation; the roof is good rock; the mines are in a good working condition.

Ventilation is produced by means of a fan; the in-take is located at mouth of slope, area 48 feet; the outcast is located in air-shaft, area 25 feet; the amount of pure air in the Top is 31,400, and in the Bottom vein 31,400 cubic feet per minute; the main doors are hung so as to close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings in one volume in each vein; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use 2 hoisting engines, 118-horse power, and 1 steam pump, 35-horse power; the boilers have been cleaned and examined and reported in good condition; they have a steam gauge to indicate the pressure of steam.

Remarks.—They have furnished a map of mines; they have a second opening; they have no house for men to wash or change in; the mining boss is a practical and competent man; there are no boys working in the mines under 12 years of age; the engineers seem to be experienced, competent and sober men; they do not allow any persons to ride on loaded cars in the mines; the parties having charge know their duty in case of death or serious accident; they have large schutes connected with these mines, where they load large railroad cars and also separate and clean the coal.

Powderly Rock Tunnel.

This tunnel is located in the township of Carbondale, and situated one-fourth of a mile south-east of the Lackawanna river. It is operated by the Delaware and Hudson canal company. Andrew B. Nicol is assistant mine superintendent and James Nicol is mining boss.

Description.—The coal mined here is prepared at Rackett Brook breaker; they mine and ship 200 tons of coal per day; they employ 30 miners, 27 laborers, 7 drivers, 7 door-boys and 5 company men in the mine; in all 76 men and boys; they are working the bottom coal of the Carbondale vein; average thickness 5½ feet; they work headings 10, air-ways 14 and chambers 36 feet wide; they leave pillars 15 feet wide to sustain the roof; they leave cross-entrances 50 feet apart, for the purpose of ventilation; the roof is slate; the mine is in a good working condition.

Ventilation is produced by two grates; the in-take is located at mouth of tunnel, area 48 feet; the out-cast is located in grate air-shaft, area 25 feet; the amount of pure air is 10,200 cubic feet per minute; the main doors are hung so as to close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings in one volume; the amount of ventilation has been measured and reported; ventilation is good.

Machinery—There is no machinery required at this tunnel.

Remarks.—They have furnished a map of mine; they have a second opening; they have no house for men to wash or change in; the mining boss is a practical and competent man; there are no boys working in the mine under 12 years of age; the parties having charge know their duty in case of death or serious accident.

No. 1 Slope.

This slope is located in the city of Carbondale, and situated on the east bank of the Lackawanna river. It is operated by the Delaware and Hudson canal company. A. B. Nicol is assistant mine superintendent and John Campbell is mining boss.

Description.—They are working only 6 men and boys; opening out the bottom vein of coal by headings and air-ways; they mine 20 tons of coal per day; they work headings 10, and air-ways 14 feet wide; the mine is in a tolerable good working condition; the slope is 358 feet long.

White Bridge Tunnel.

This tunnel is located in the city of Carbondale; it is operated by the Delaware and Hudson canal company. John Campbell is mining boss, and William Bowers is outside foreman.

Description.—There are large schutes connected with these mines; they mine and prepare about 550 tons of coal per day; they employ 78 miners, 53 laborers, 27 drivers, 2 door-boys and 9 company men in the mines; 4 slate pickers, 12 head and plate men, 2 drivers, 1 company man, 4 mechanics and 2 bosses outside; in all 194 men and boys; they are working the Top and Bottom veins, average thickness of each 6 feet; they work headings 10, air-ways 14 and chambers 36 feet wide; they leave pillars from 14 to 15 feet wide to sustain the roof; they leave cross-entrances about 50 feet apart for the purpose of ventilation; the roof is slate and rock; the mines are in a good working condition.

Ventilation is produced by means of a furnace; the in-take is located at mouth of tunnel, area 50 feet; the out-cast is located in furnace air-shaft, area 25 feet; the amount of pure fresh air is 13,400 cubic feet per minute; the main doors are hung so that they will close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings in one volume; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use 1 pumping engine, 61 3-5-horse power; they use no machinery around the tunnel.

Remarks.—They have furnished a map of mines; they have a second opening for both veins; they have no house for men to wash or change in; the mining boss seems to be a practical and competent man; there are no boys working in the mines under 12 years of age; the engineer seems to be an experienced, competent and sober man; the parties having charge know their duty in case of death or serious accident; the Top and Bottom veins of coal here are worked by driving the bottom chambers first, and then drawing the Top vein back; when the chambers are worked their full length the rock between both veins averages 3 feet.

No. 3 Shaft—Carbondale City.

This shaft is 70 feet deep to the Bottom vein. It is operated by the Delaware and Hudson canal company. John Hughes is mining boss and Wm. Bowers is outside foreman.

Description.—There are large schutes connected with this mine; they mine about 400 tons of coal per day; they employ 82 miners, 29 laborers, 22 drivers, 2 door-boys and 9 company men in the mine; 4 slate pickers, 12 company men, 3 mechanics and 2 bosses outside; in all 165 men and boys; they are working the Bottom vein of coal; average thickness 5½ feet; they work headings 10, air-ways 14 and chambers 36 feet wide; they leave pillars about 15 feet wide to sustain the roof; they leave cross-entrances about 50 feet apart, for the purpose of ventilation; the roof is slate; the mine is in a good working condition.

Ventilation is produced by the action of the atmosphere, and when necessary assisted by a furnace; the in-take is located in second opening, area 49½ feet; the up-cast is located in White Bride furnace air-shaft, and in Fall Brook tunnel, area 60 feet; the amount of pure fresh air is 14,700 cubic feet per minute; the main doors are hung so that they will close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings in one volume; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use 1 hoisting engine of 77-horse power; they have flanges of sufficient strength and dimensions attached to the hoisting drum; the boilers have been cleaned and examined, and reported in good condition; they have a steam gauge to indicate the pressure of steam.

Remarks.—They have furnished a map of mine; they have a second opening; they have no house for men to wash or change clothes in; the mining boss seems to be a practical and competent man; there are no boys working in the mine under 12 years of age; the engineer seems to be an experienced, competent and sober man; the parties having charge know their duty in case of death or serious accident; the shaft landings are protected by safety gates. It is a very difficult matter to ventilate this mine, as it is connected with miles of old workings, where the top coal was taken out several years ago; they are now taking the bottom coal out from under the old workings that have caved into the surface in some places, and in other places the old works are in good condition; there is only 3 feet of roof between the bottom vein which they are now working, and the top vein which has been worked out; sometimes there is a cave in of the roof between the two veins, which causes a leak in the current of air, which is almost impossible to prevent. They work one pillar and chamber under the other, or in other words, the workings in the bottom vein is the same as the top vein.

Coal Brook Tunnel.

This tunnel is located in Carbondale city; it is operated by the Delaware and Hudson canal company. E. E. Thomas is mining boss, and W. P. E. Morss is outside foreman.

Description.—There is a breaker connected with this mine, located about 1,400 feet from main opening: they mine and prepare about 250 tons of coal per day; they employ 70 miners, 57 laborers, 24 drivers, 4 door-boys and 6 company men in the mine; 65 slate pickers, 6 head and plate men, 11 drivers, 20 company men, 7 mechanics and 1 boss outside; they have 24 persons working in different capacities in and around the breaker; in all 295 men and boys; they are working the Bottom vein of coal, average thickness 5½ feet; they work headings 10, air-ways 14 and chambers 36 feet wide; they leave pillars about 14 feet wide to sustain the roof; they leave cross-entrances about 40 feet apart for the purpose of ventilation; the roof is rock; the mine is in a good safe working condition.

Ventilation is produced by means of a furnace; the intake is located at mouth of tunnel, area 42 square feet; the upcast is located in furnace air-shaft, area 34 square feet; the amount of pure fresh air is 20,000 cubic feet per minute; the main doors are hung so that they will close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings in two splits; the amount of fresh air has been measured and reported; ventilation is good.

Machinery.—They use 1 breaker engine, 77-horse power, and 1 hoisting engine, 56-horse power; the boilers have been cleaned and examined and reported in good condition; there is no machinery required at the tunnel, as it is driven to drain itself.

Remarks.—They have furnished a map of mine; they have a second opening; they have no house for men to wash or change in; the mining boss seems to be a practical and competent man; there are no boys working in the mine under 12 years of age; the engineers seem to be experienced, competent and sober men; they do not allow any persons to ride on loaded cars on the planes in the mine; the parties having charge know their duty in case of death or serious accident; the breaker machinery is boxed and fenced off so that operatives are safe.

Breaker Tunnel.

This tunnel is located in Carbondale city, and situated about one-fourth of a mile from the Lackawanna river. It is operated by the Delaware and Hudson canal company. E. E. Thomas is mining boss.

Description.—The coal mined here is prepared at Coal Brook breaker; they mine about 150 tons of coal per day; they employ 34 miners, 28 laborers, 10 dri-

vers, 3 door-boys and 1 company man in the mine; in all 76 men and boys; they are working the Bottom vein of coal; average thickness 5½ feet; they work headings 10, air-ways 14 and chambers 36 feet wide; they leave pillars from 12 to 14 feet wide to sustain the roof; they leave cross-entrances 40 feet apart, for the purpose of ventilation; the roof is rock; the mine is in a good safe working condition.

Ventilation is produced by means of a furnace; the in-take is located at mouth of tunnel, area 48 feet; the up-cast is located in furnace air-shaft, area 34 feet; the amount of pure fresh air is 21,000 cubic feet per minute; the main doors are hung so that they will close of their own accord; they have attendants at main doors; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—There is no machinery required at this tunnel.

Remarks.—They have furnished a map of mine; they have a second opening; they have no house for men to wash or change in; the mining boss seems to be a practical and competent man; there are no boys working in the mine under 12 years of age; the parties having charge know their duty in case of death or serious accident.

Lackawanna Tunnel.

This tunnel is located in Carbondale city. It is operated by the Delaware and Hudson canal company. Wm. M'Wyne is mining boss.

Description.—The coal mined at this tunnel is prepared at Coal Brook breaker: they mine about 200 tons of coal per day; they employ 40 miners, 19 laborers, 16 drivers, 4 door-boys and 3 company men in the mine; in all 82 men and boys; they are working the Bottom vein; average thickness 5½ feet; they work headings 10, air-ways 14 and chambers 36 feet wide; they leave pillars 15 feet wide to sustain the roof; they leave cross-entrances 50 feet apart, for the purpose of ventilation; the roof is rock; the mine is in a good working condition.

Ventilation is produced by means of a furnace; the in-take is located at mouth of tunnel, area 40 feet; the out-cast is located in furnace air-shaft, area 39 feet; the amount of fresh air is 11,500 cubic feet per minute; the main doors are hung so that they will close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings in one volume; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They require no machinery around the workings.

Remarks.—They have furnished a map of mine; they have a second opening; they have no house for men to wash or change in; the mining boss seems to be a practical and competent man; there are no boys working in the mine under 12 years of age; the parties having charge know their duty in case of death or serious accident.

Valley Tunnel.

This tunnel is located in Carbondale city; it is operated by the Delaware and Hudson canal company. William M'Myne is mining boss.

Description.—The coal mined here is prepared at Coal Brook breaker; they mine about 170 tons of coal per day; they employ 38 miners, 10 laborers, 9 drivers, 2 door-boys and 3 company men in the mine; in all 62 men and boys; they are working the Bottom vein of coal, average thickness 6 feet; they work headings 10, air-ways 14 and chambers 36 feet wide; they leave pillars 15 feet wide to sustain the roof; they leave cross-entrances 50 feet apart for the purpose of ventilation; the roof is good rock; the mine is in a good safe working condition.

Ventilation is produced by means of a furnace; the in-take is located at mouth of tuunel, area 39 feet; the upcast is located in furnace air-shaft, area 40 feet; the amount of fresh air is 7,000 cubic feet per minute; the main doors are hung so as to close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings in one volume; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—There is no machinery required at this tunnel.

Remarks.—They have furnished a map of mine; they have a second opening; they have no house for men to wash or change in; the mining boss seems to be a practical and competent man; there are no boys working in the mine under 12 years of age; the parties having charge know their duty in case of death or serious accident.

Mill Ridge Tunnel.

This tunnel is located in Fell township, and situated on the west bank of the Lackawanna river. It is operated by the Delaware and Hudson canal company. Wm. M'Wyne is mining boss.

Description.—The coal mined here is prepared at Coal Brook breaker; they mine about 75 tons of coal per day; they employ 20 miners, 8 laborers, 4 drivers, 2 door-boys and 2 company men in the mine; in all 36 men and boys; they are working the Top vein; average thickness 5½ feet; they work headings 10, airways 14 and chambers 36 feet wide; they leave pillars 17 feet wide to sustain the roof; they leave cross-entrances 50 feet apart, for the purpose of ventilation; the roof is rock; the mine is in a good working condition.

Ventilation is produced by grates; the in-take is located at mouth of tunnel, area 55 feet; the up-cast is located in the air-shaft, area 42 feet; the amount of pure air is 11,200 cubic feet per minute; the main doors are hung so that they will close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings in one volume; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—There is no machinery required at this tunnel.

Remarks.—They have furnished a map of mine; they have a second opening: they have no house for men to wash or change in; the mining boss seems to be a practical and competent man; there are no boys working in the mine under 12 years of age; the parties having charge know their duty in case of death or serious accident.

Jefferson Tunnel.

This tunnel is located in Fell township, and situated on the west bank of the Lackawanna river; it is operated by the Delaware and Hudson canal company. William M'Myne is mining boss.

Description.—The coal mined here is prepared at Coal Brook breaker; they mine about 50 tons of coal per day; they employ 12 miners, 7 laborers, 4 drivers, 1 door-boy and 2 company men in the mine; in all 26 men and boys; they are working the Bottom vein of coal, average thickness 5½ feet; they work headings 10, air-ways 14 and chambers 36 feet wide; they leave pillars 15 feet wide to sustain the roof; they leave cross-entrances 50 feet apart for the purpose of ventilation; the roof is rock; the mine is in a good working condition.

Ventilation is produced by grates; the in-take is located at mouth of tunnel, area 55 feet; the out-cast is located in air-shaft, area 41 feet; the amount of pure fresh air is 9,900 cubic feet per minute; the main doors are hung so that they will close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings in one volume; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—There is no machinery required at the mine.

Remarks.—They have furnished a map of mine; they have a second opening: they have no house for men to wash or change in; the mining boss seems to be a practical and competent man; there are no boys working in the mine under 12 years of age; the parties having charge know their duty in case of death or serious accident.

Rackett's Brook Breaker.

This breaker is located 2 miles north of the city of Carbondale, and situated on the loaded track of the Delaware and Hudson canal company's railroad; it is operated by the Delaware and Hudson canal company. William Bowers is assistant superintendent. The coal prepared at this breaker is shipped from the mines in Carbondale that have no breaker connected with them; they employ 134 men and boys in and around this breaker.

PATRICK BLEWITT,
Inspector of Mines, &c.

Scranton, *March*, 1873.